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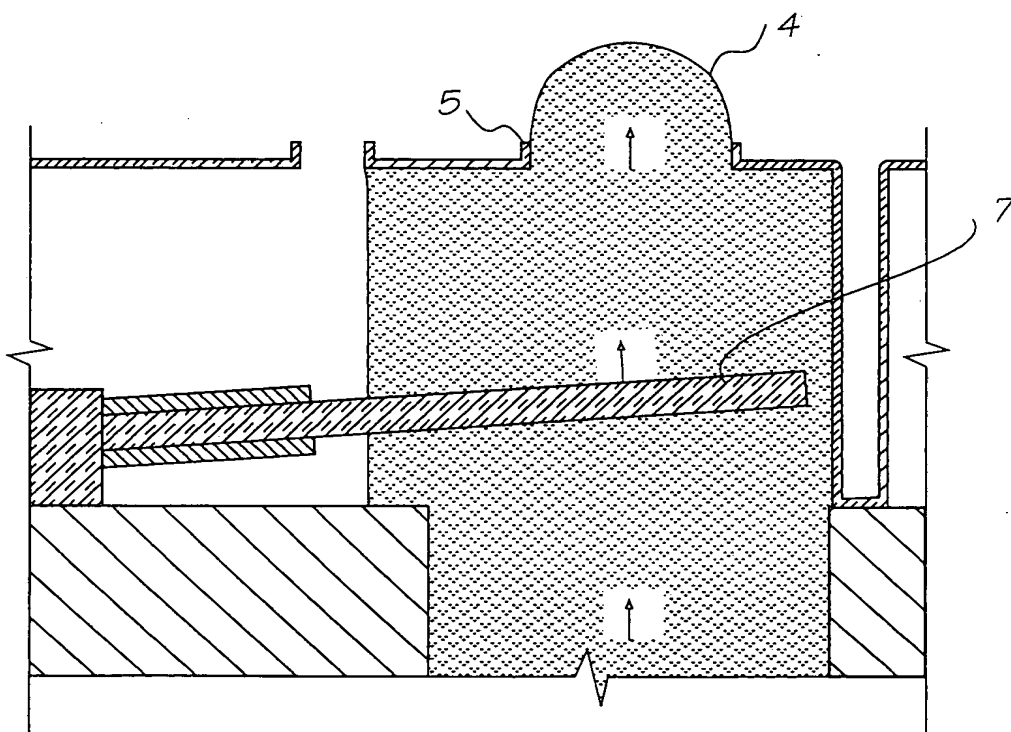
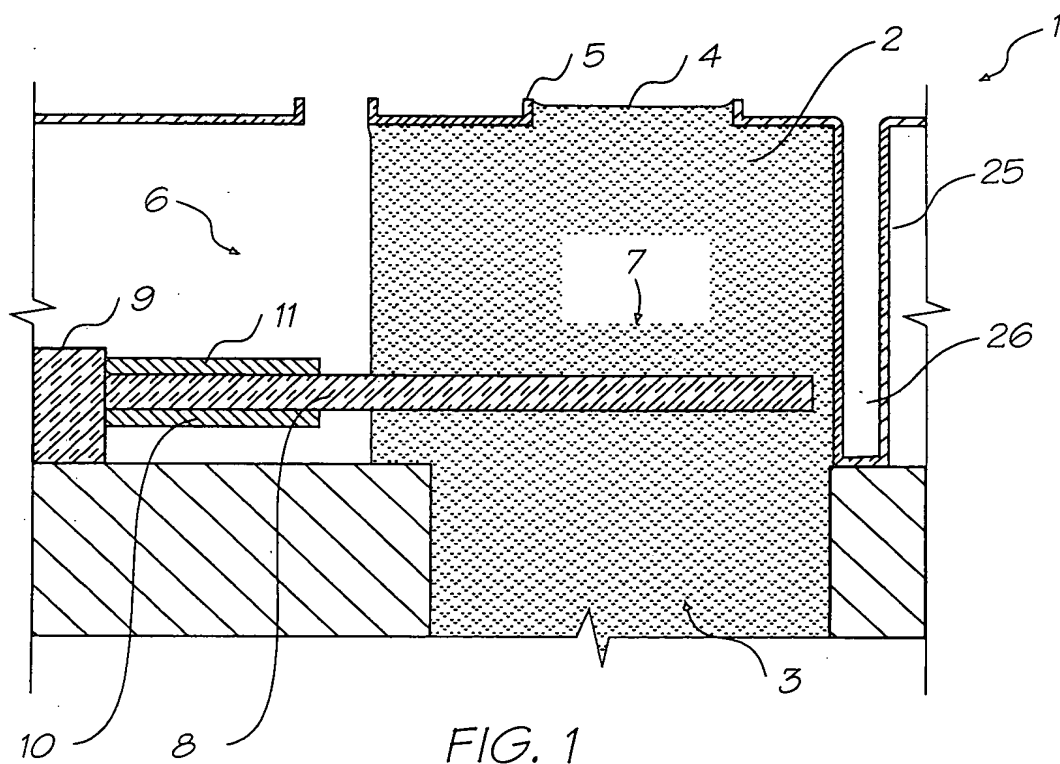
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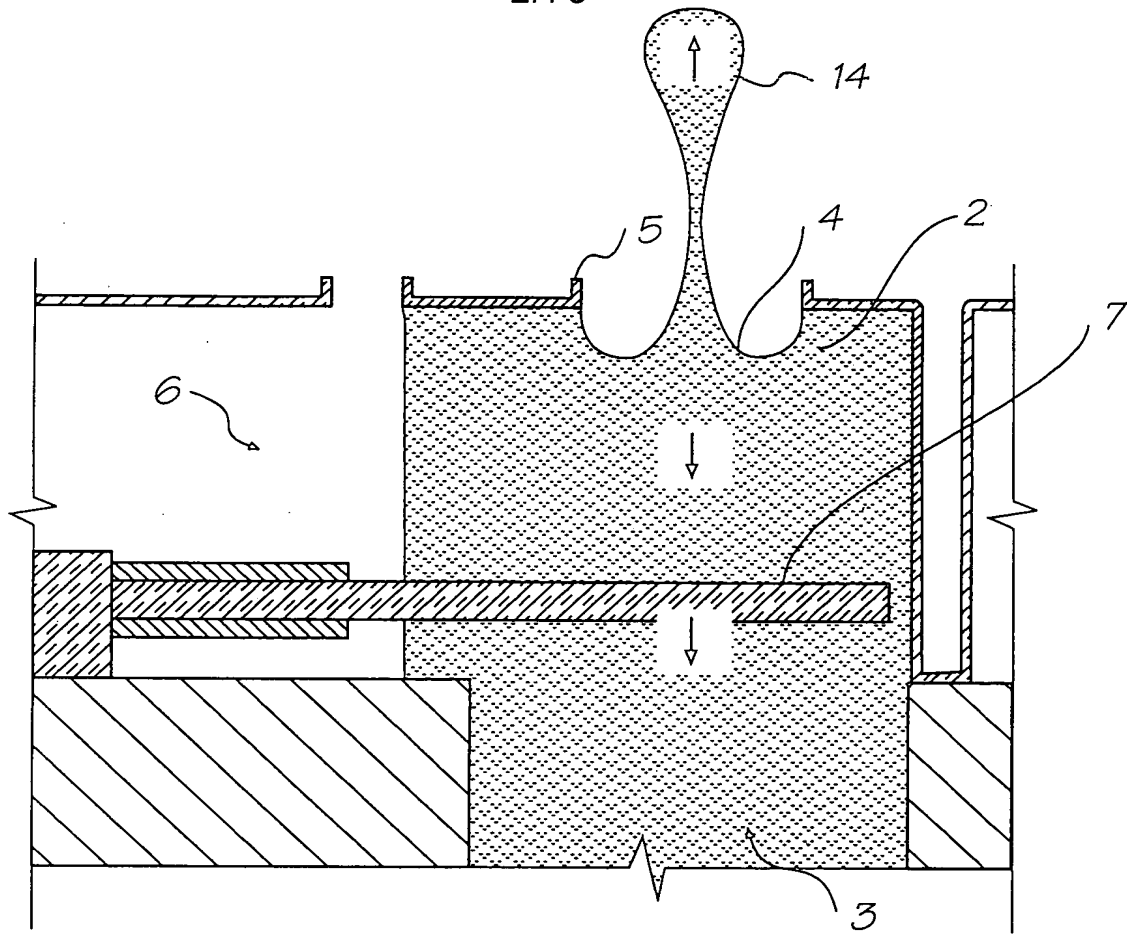


FIG. 3

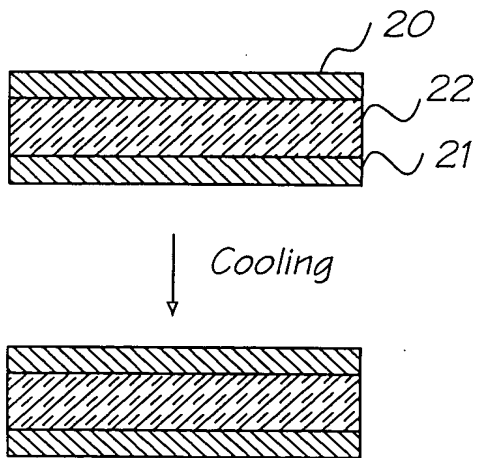


FIG. 4

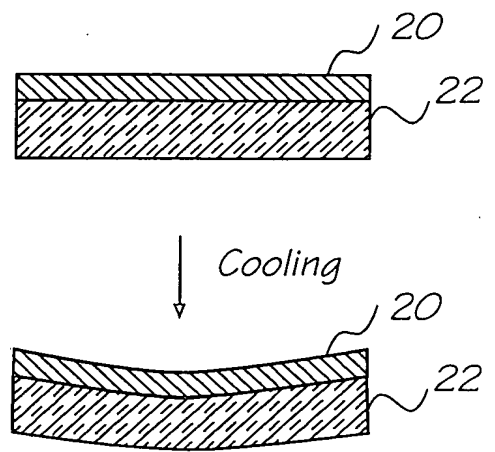


FIG. 5

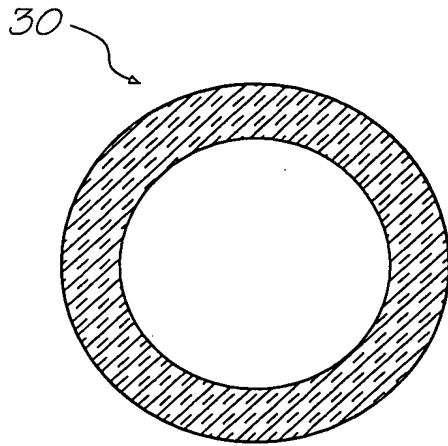


FIG. 6

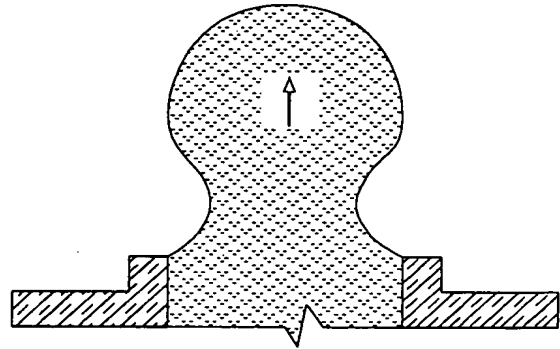


FIG. 7

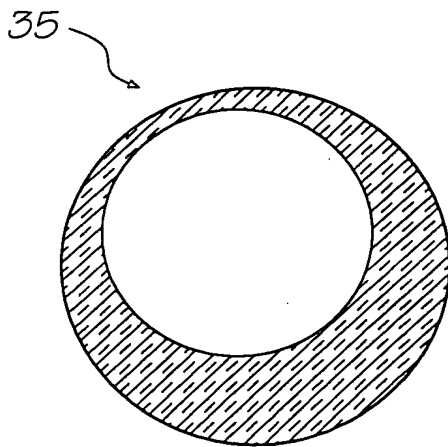


FIG. 8

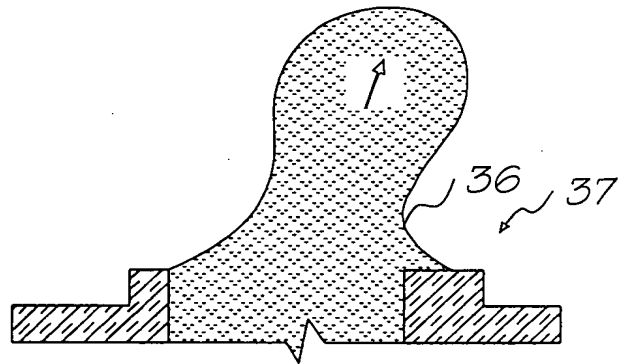


FIG. 9

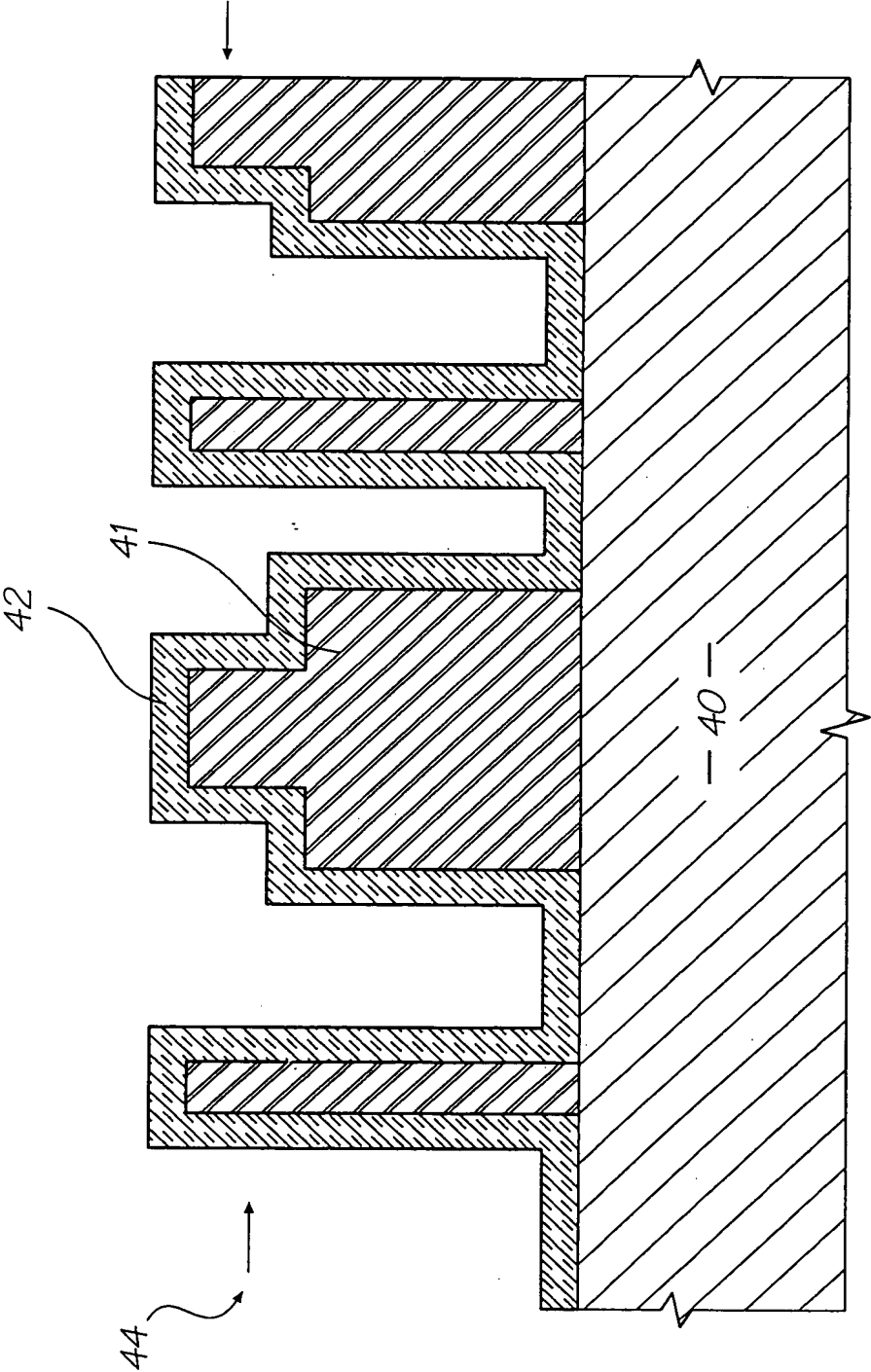


FIG. 10

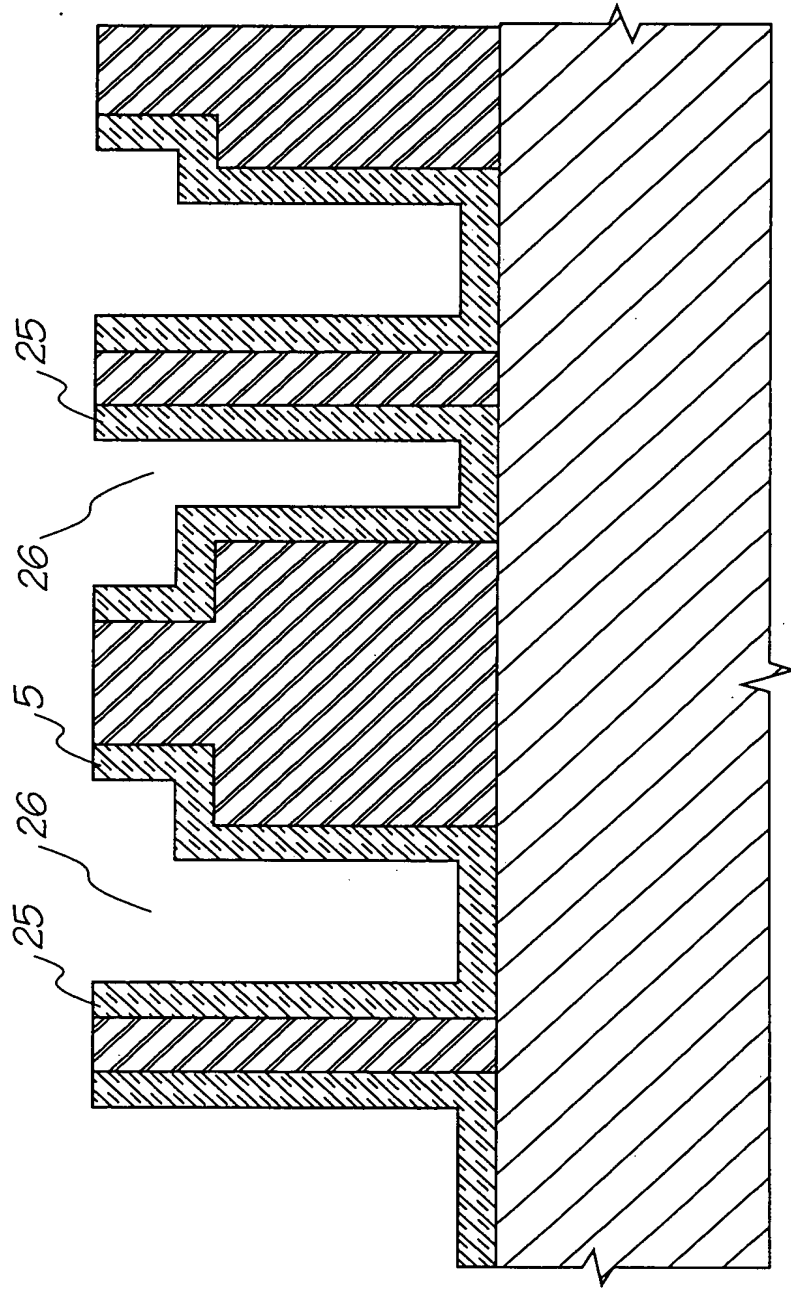


FIG. 11

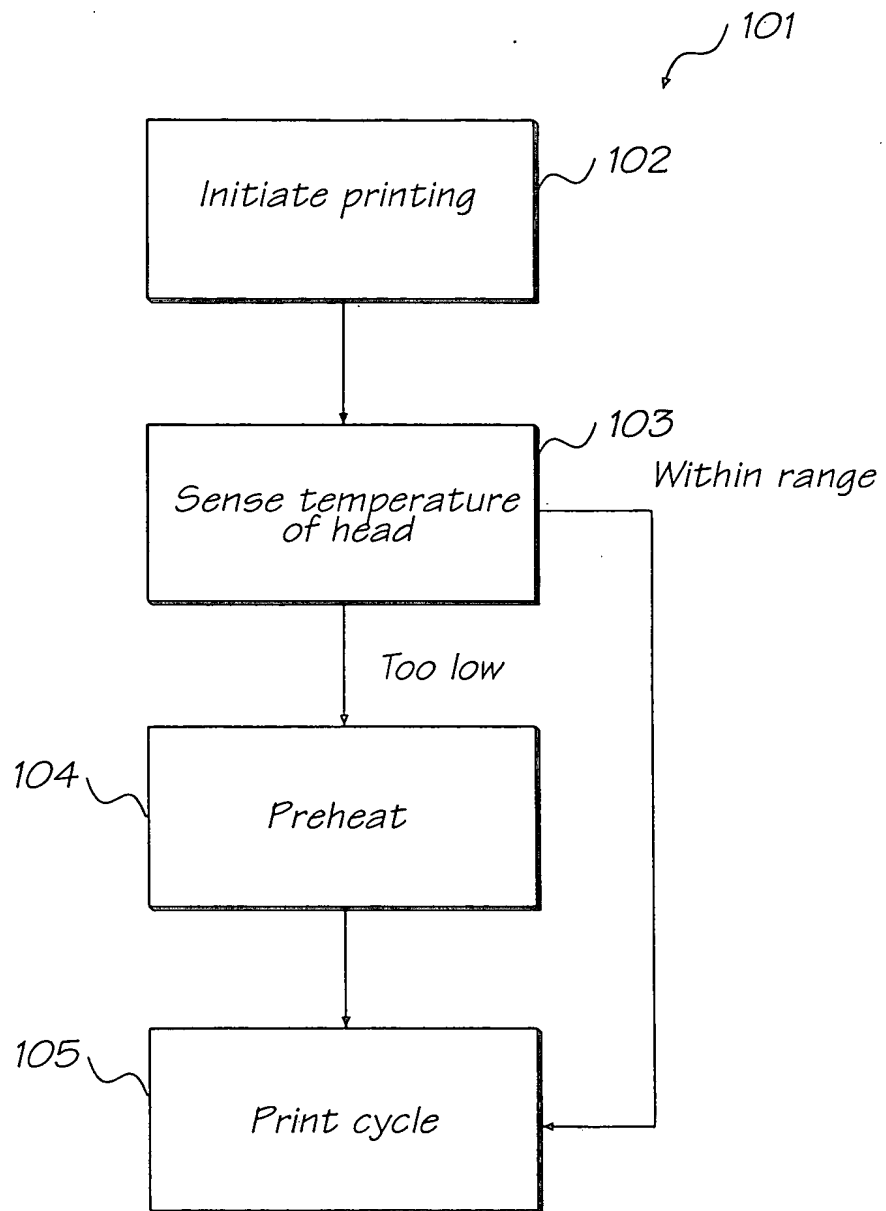


FIG. 12

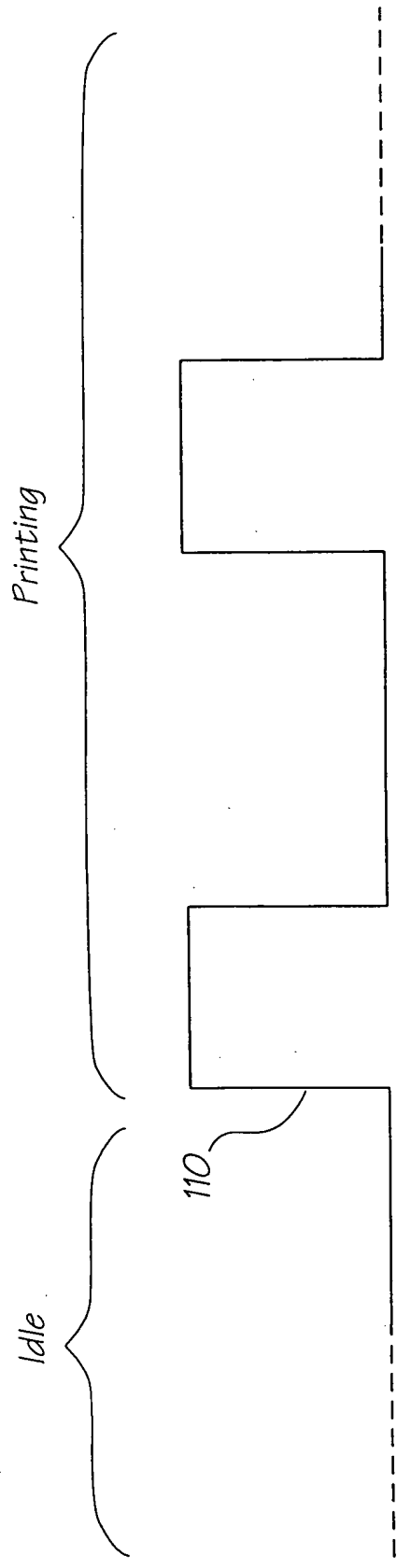


FIG. 13

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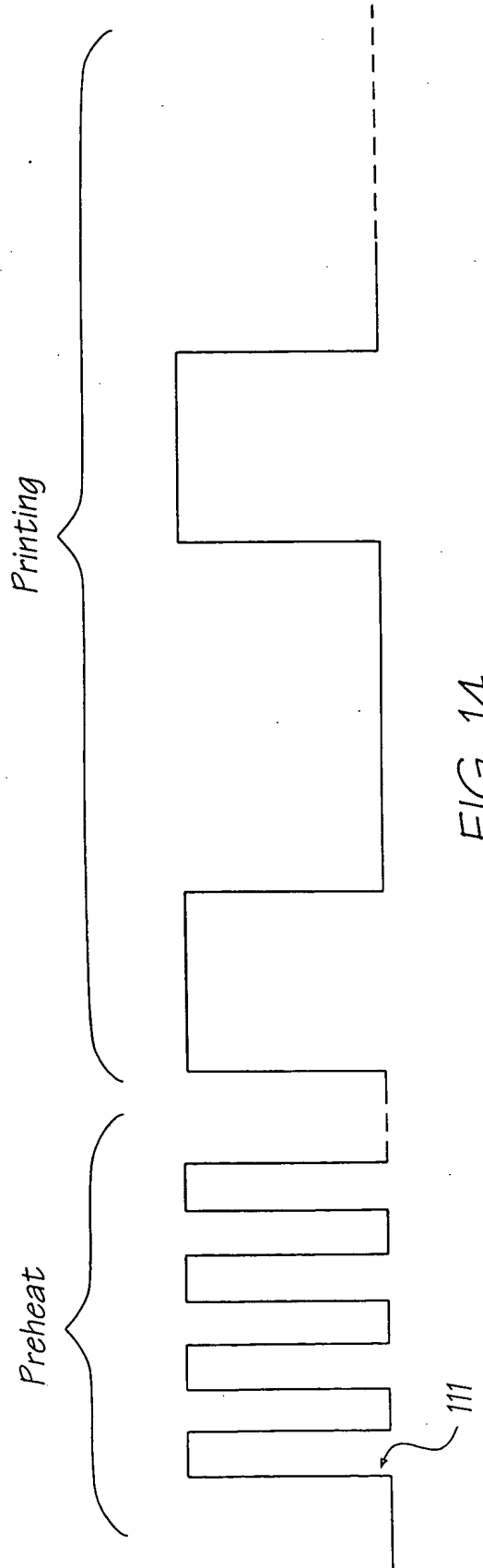


FIG. 14



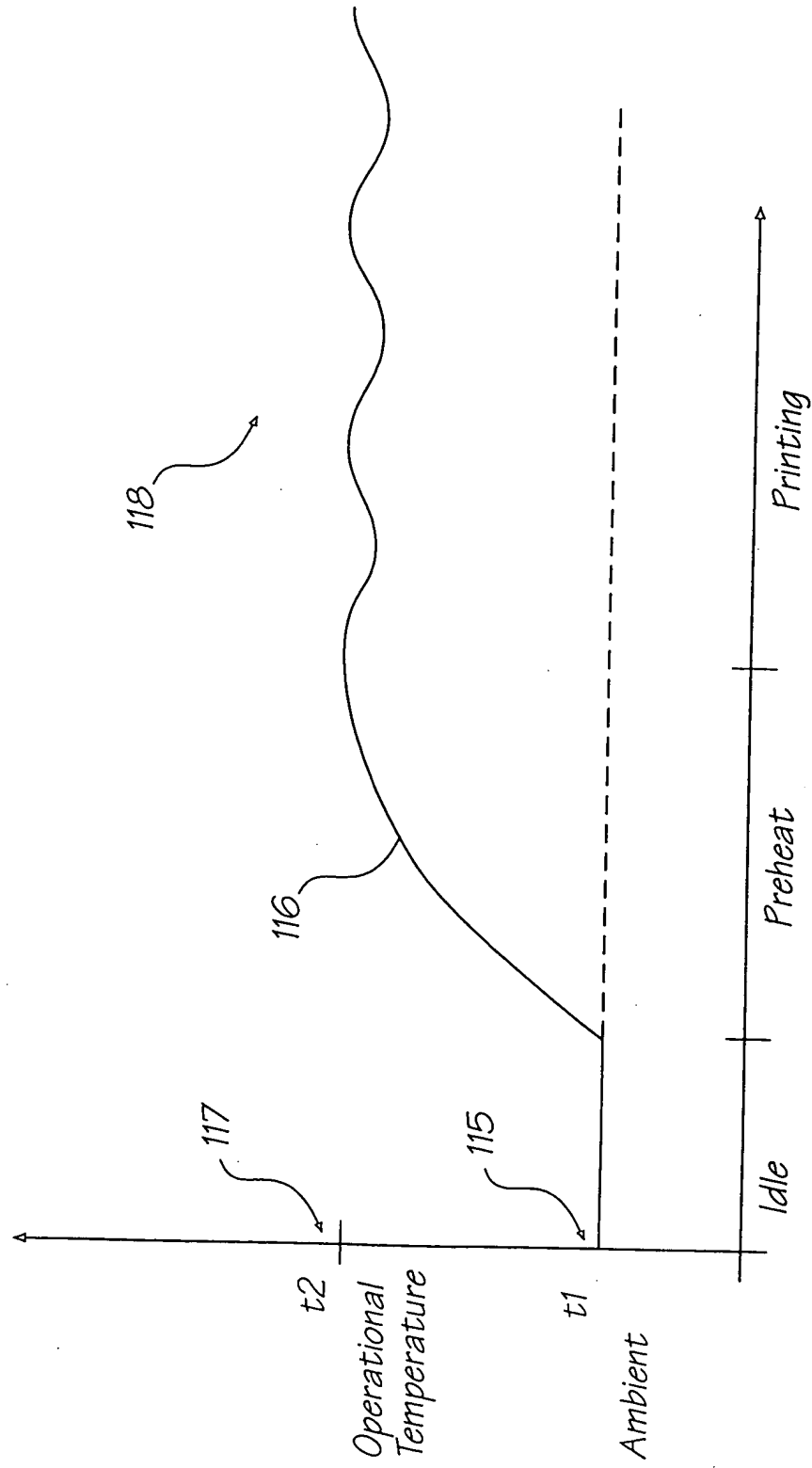


FIG. 15

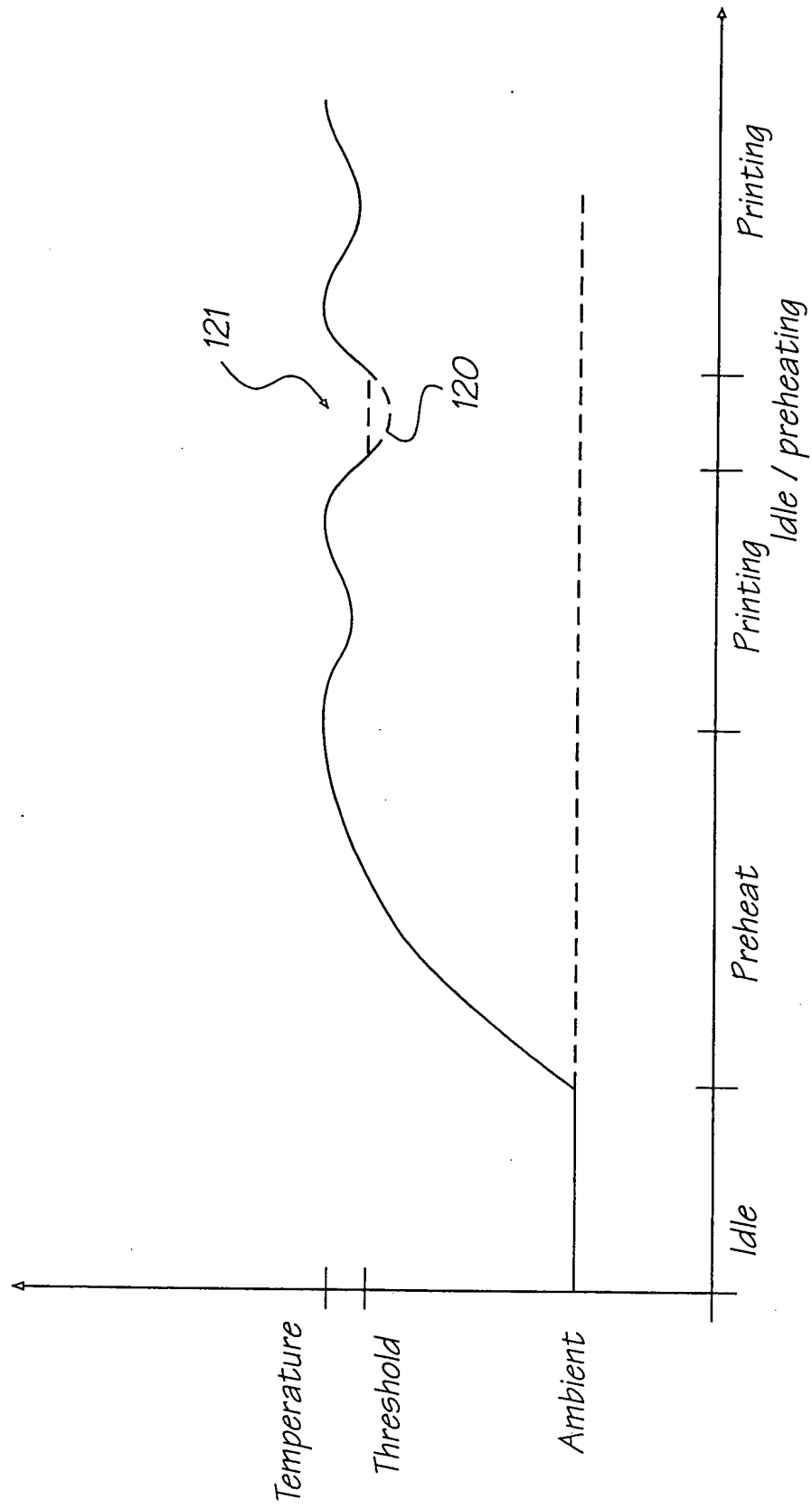


FIG. 16

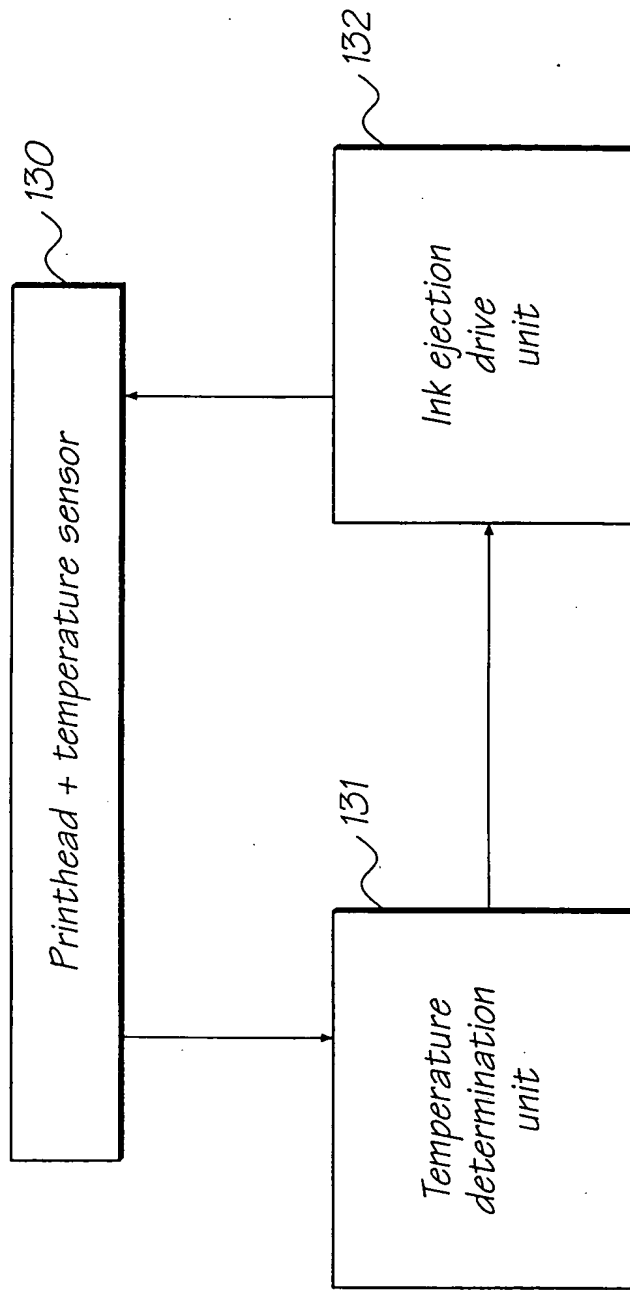


FIG. 17

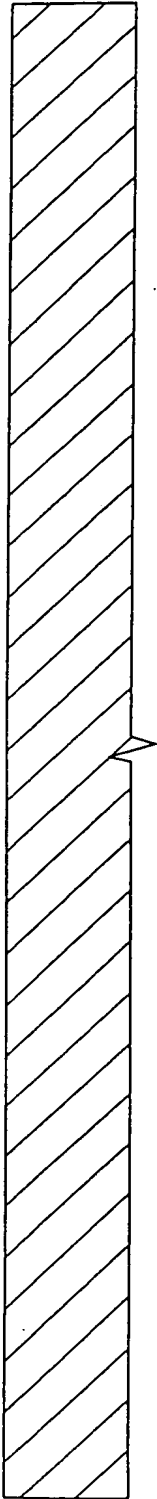
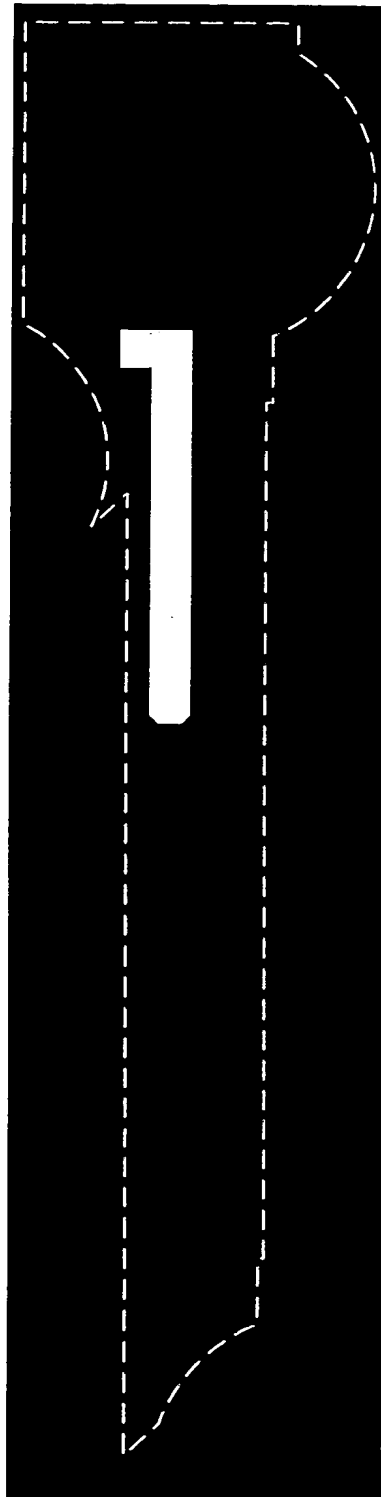
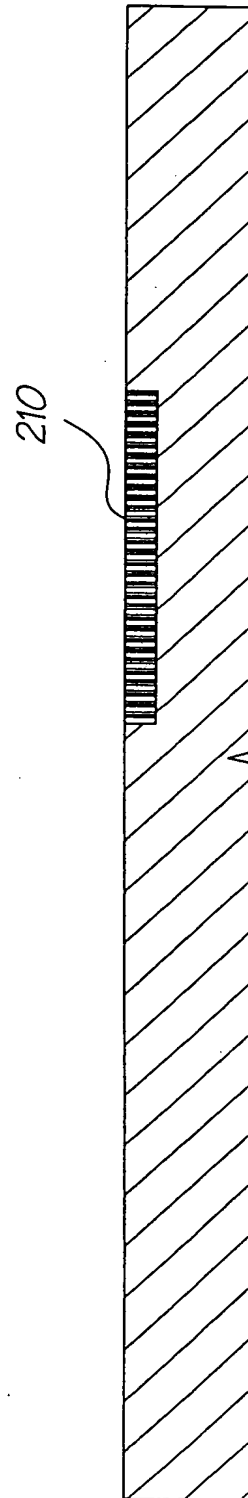


FIG. 18



N-Well mask

FIG. 19



Implant N-Well

FIG. 20

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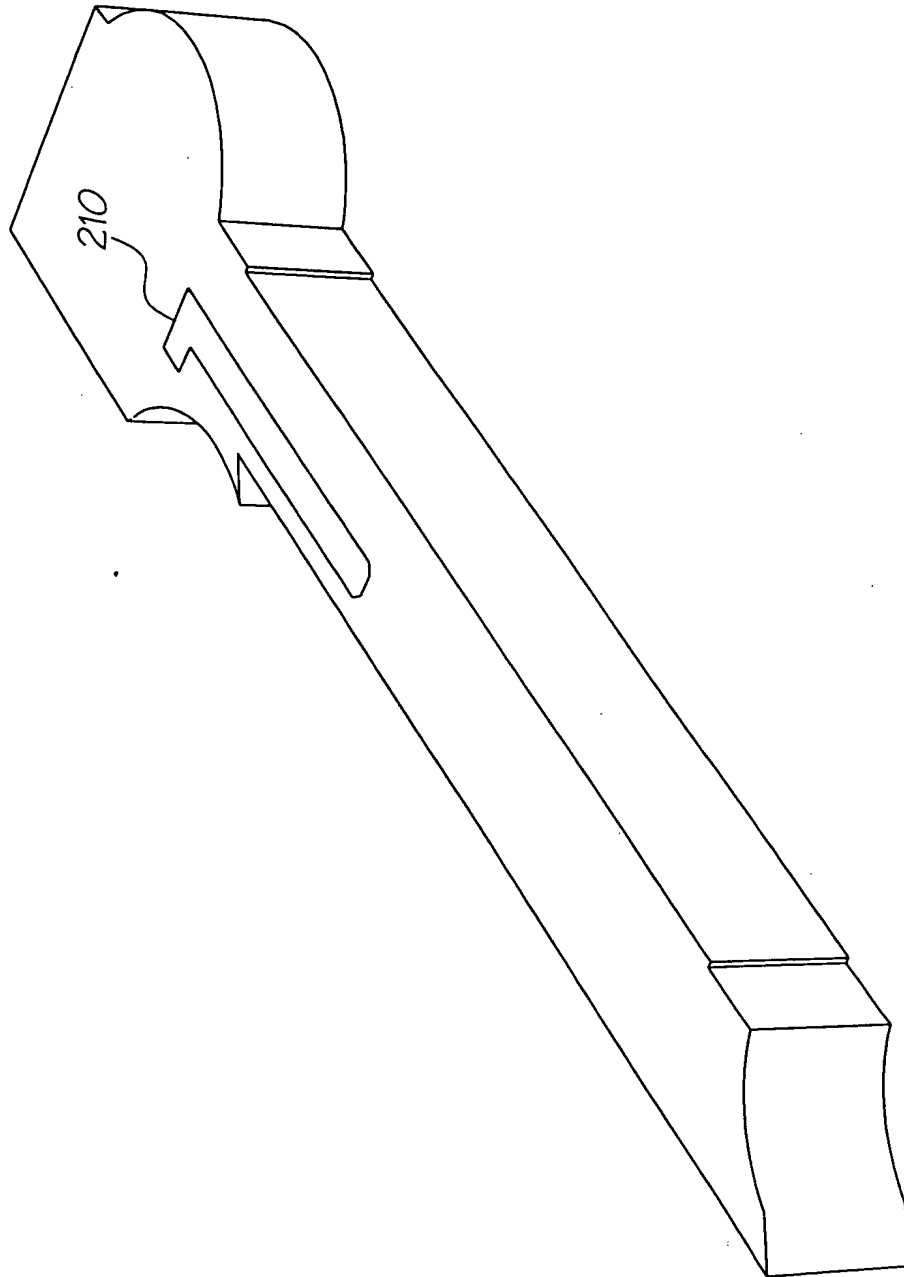
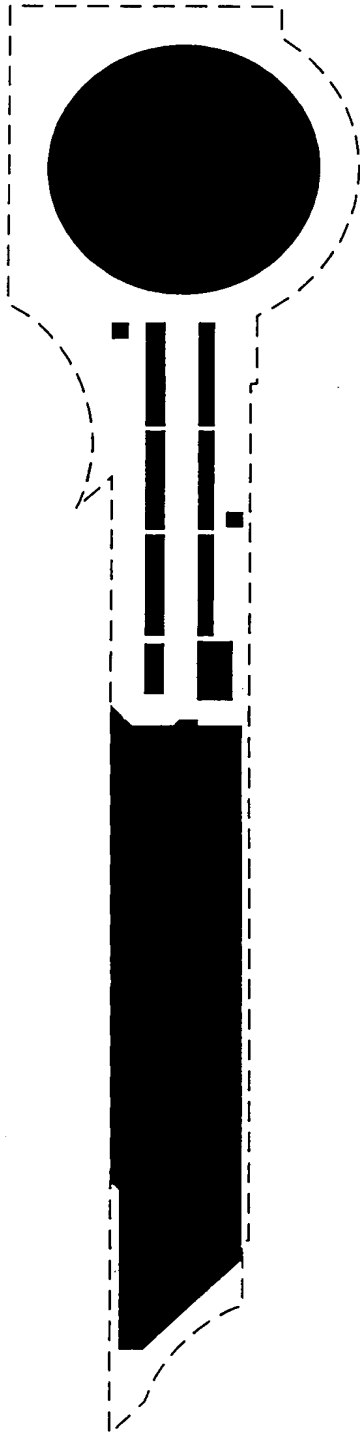
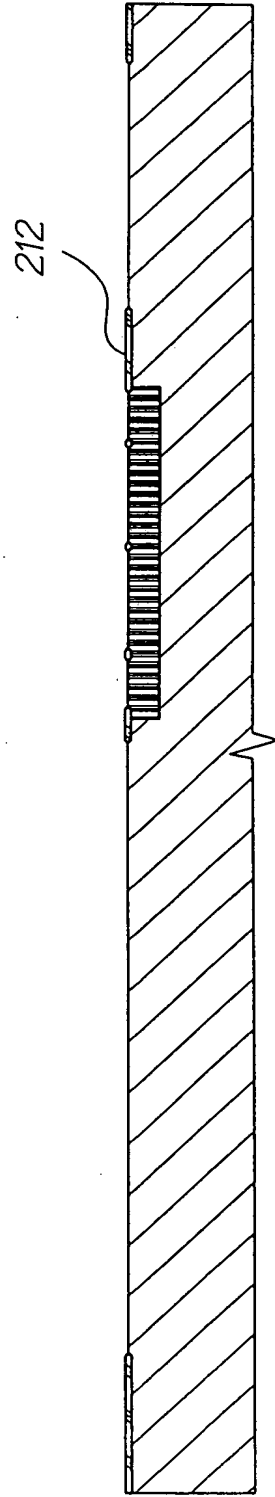


FIG. 21



Active mask

FIG. 22



Grow field oxide

FIG. 23

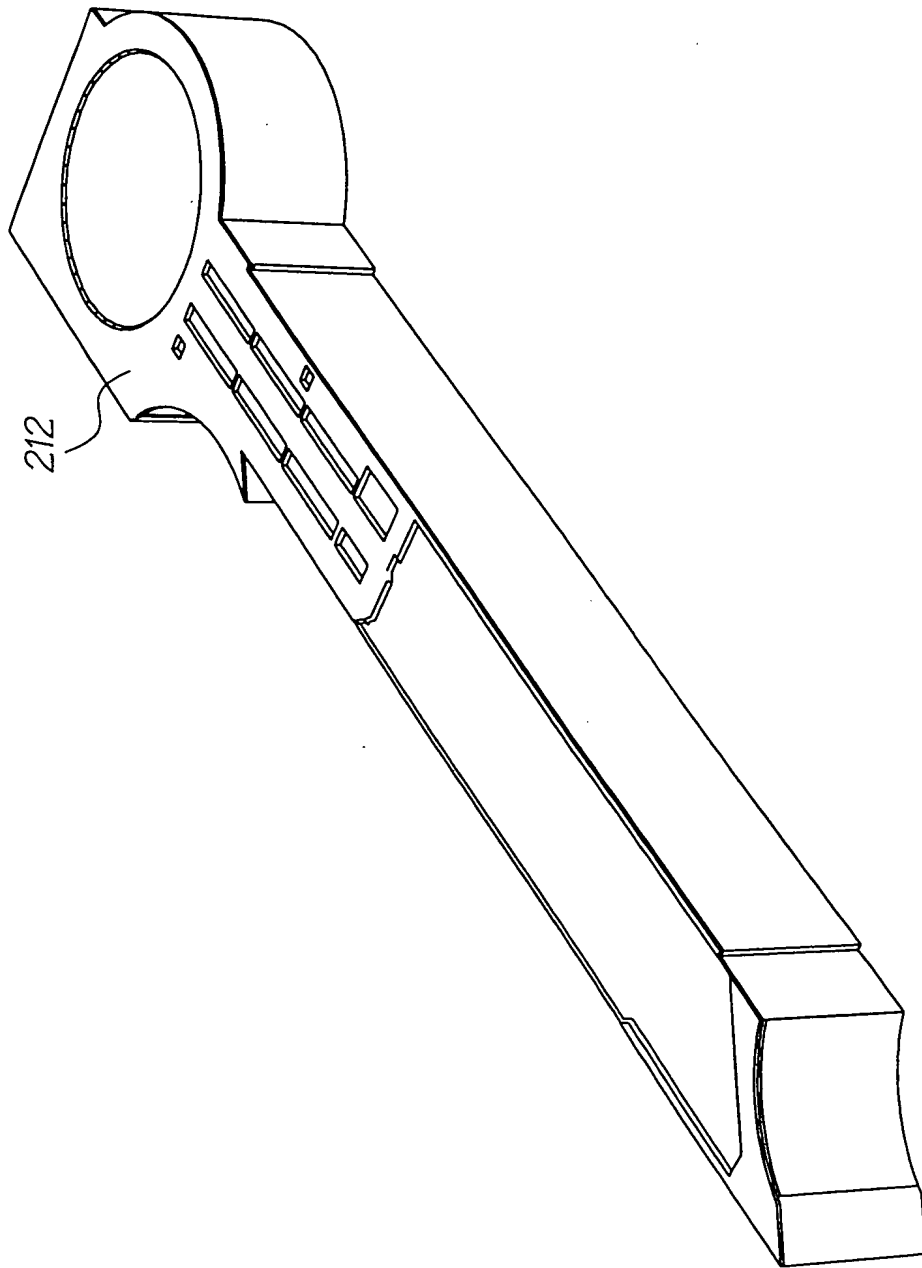
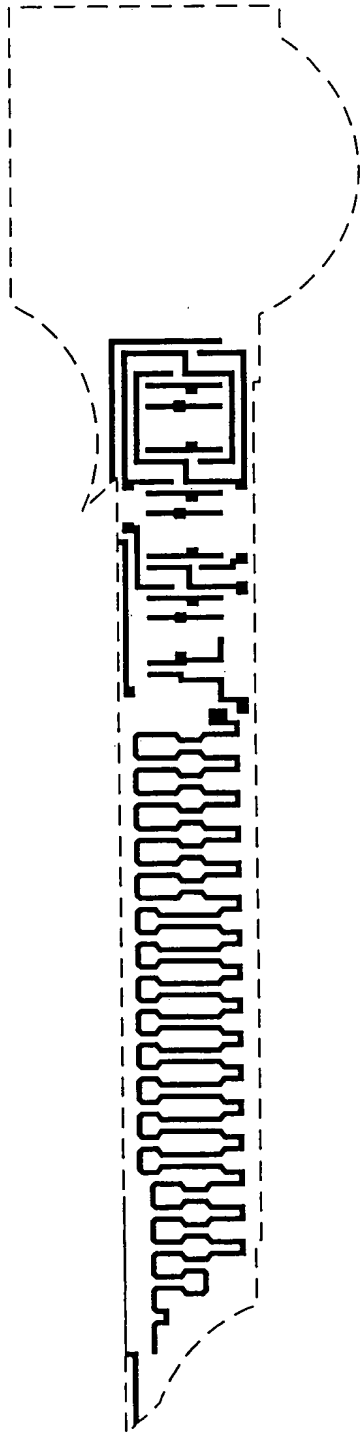
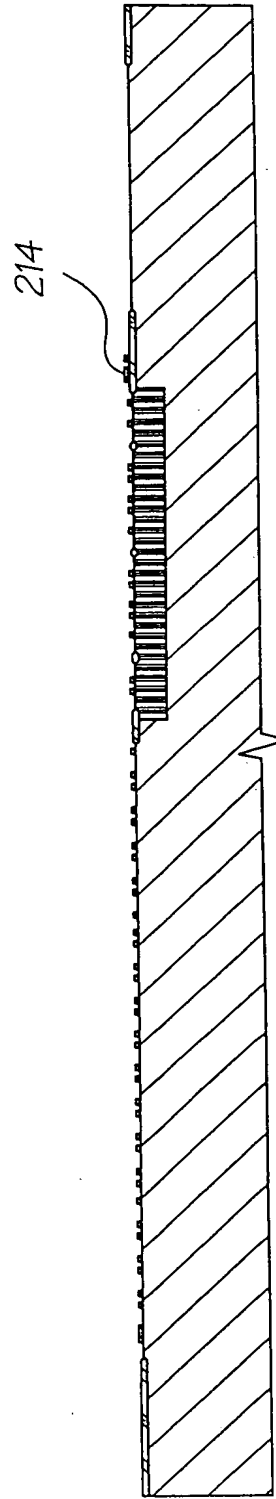


FIG. 24



*Poly mask*

*FIG. 25*



*Deposit poly*

*FIG. 26*



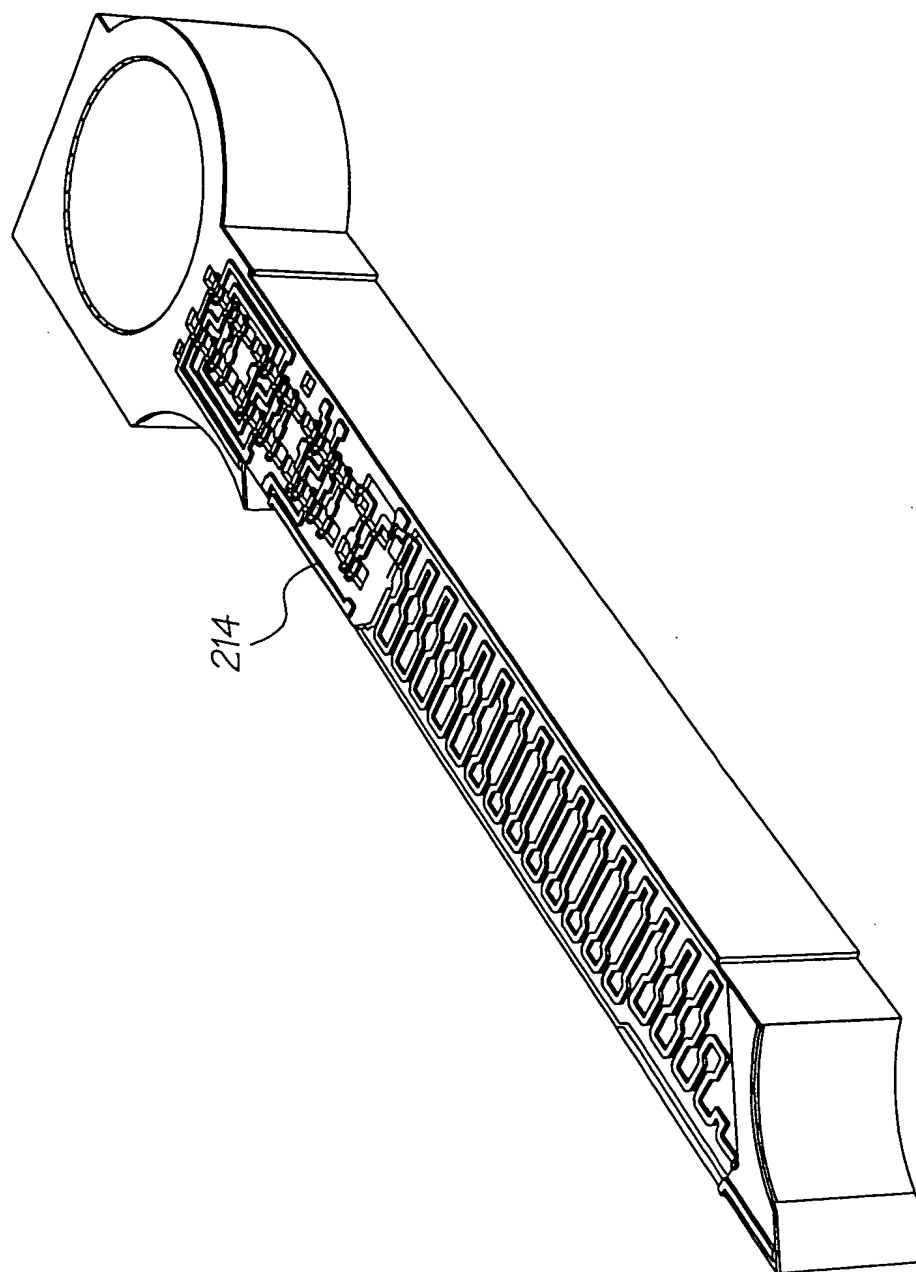
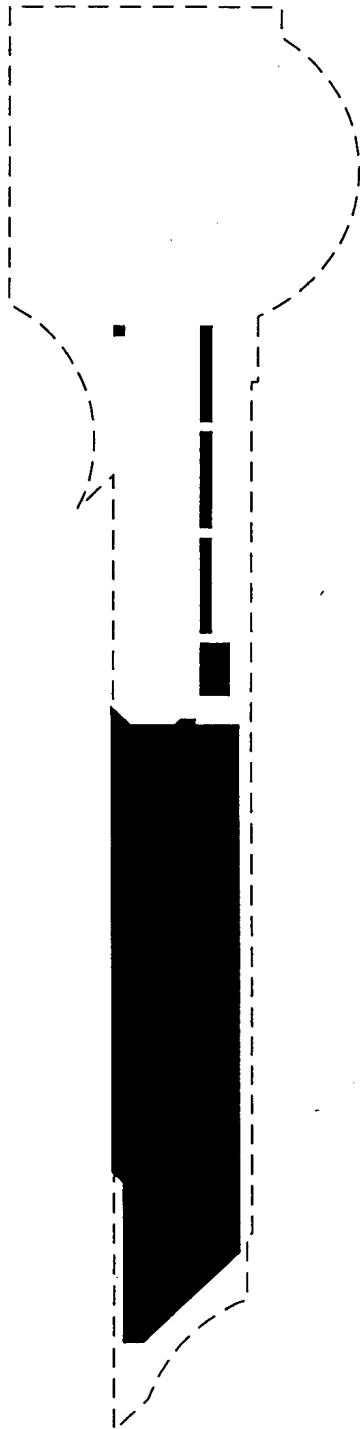
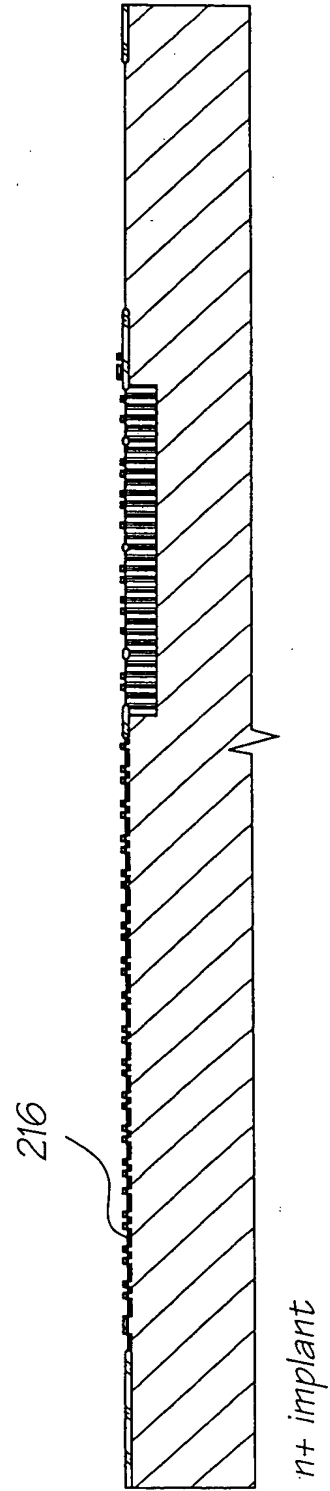


FIG. 27



*n+* mask

FIG. 28



*n+* implant

FIG. 29

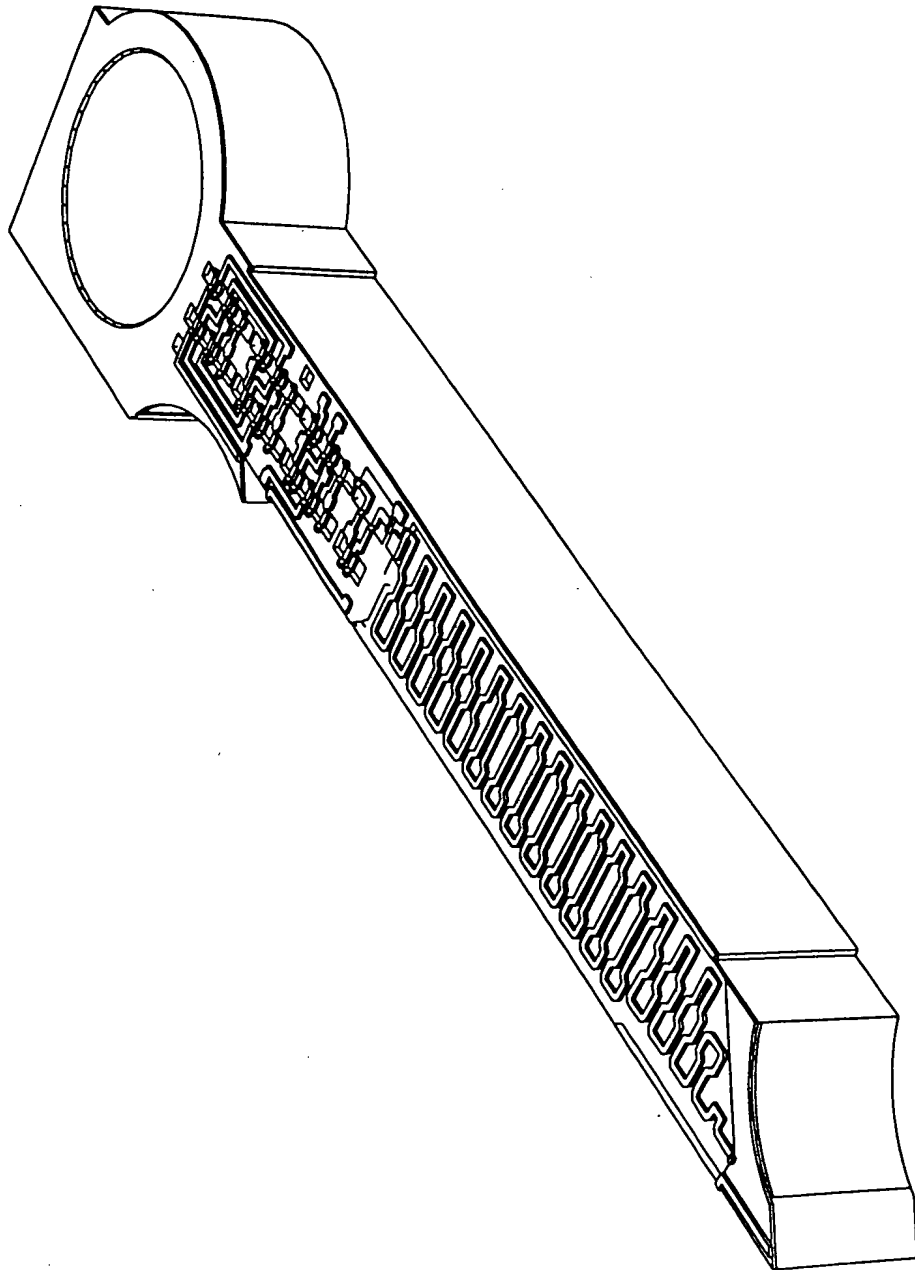
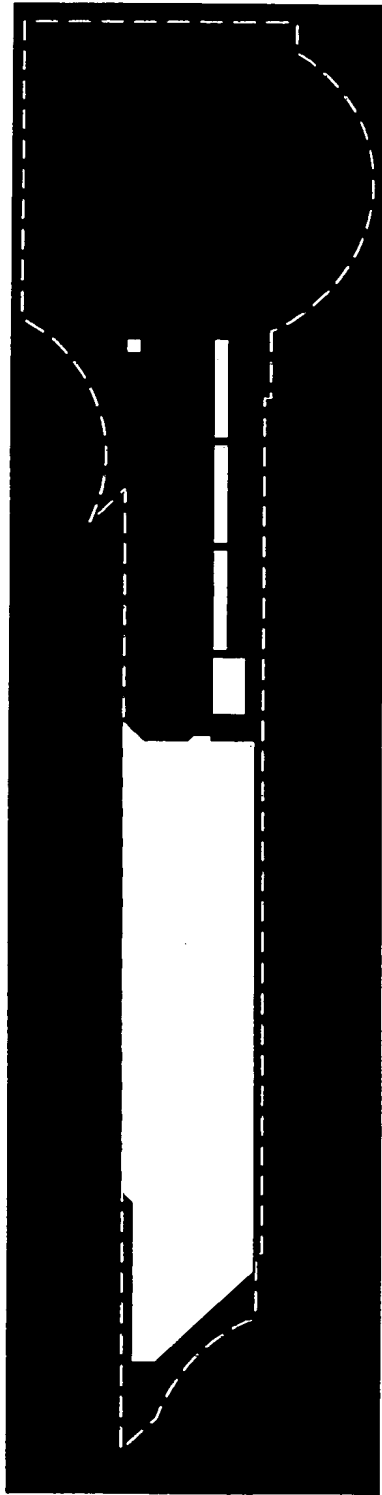
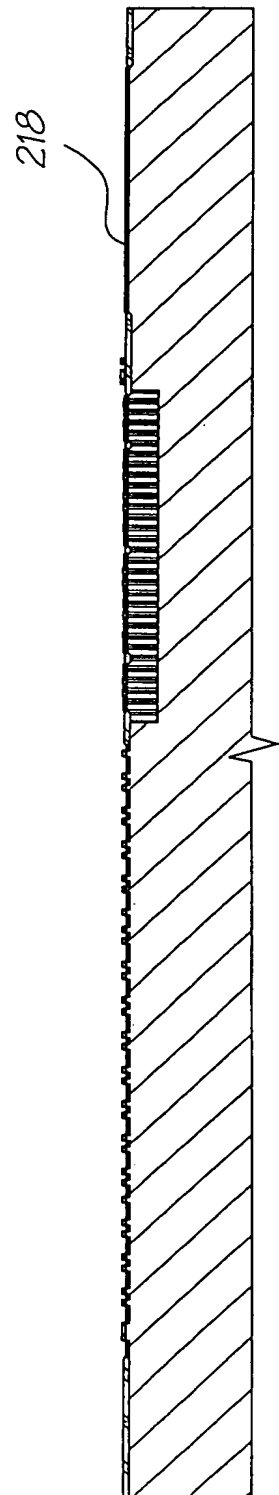


FIG. 30



*p+ mask*

FIG. 31



*p+ implant*

FIG. 32

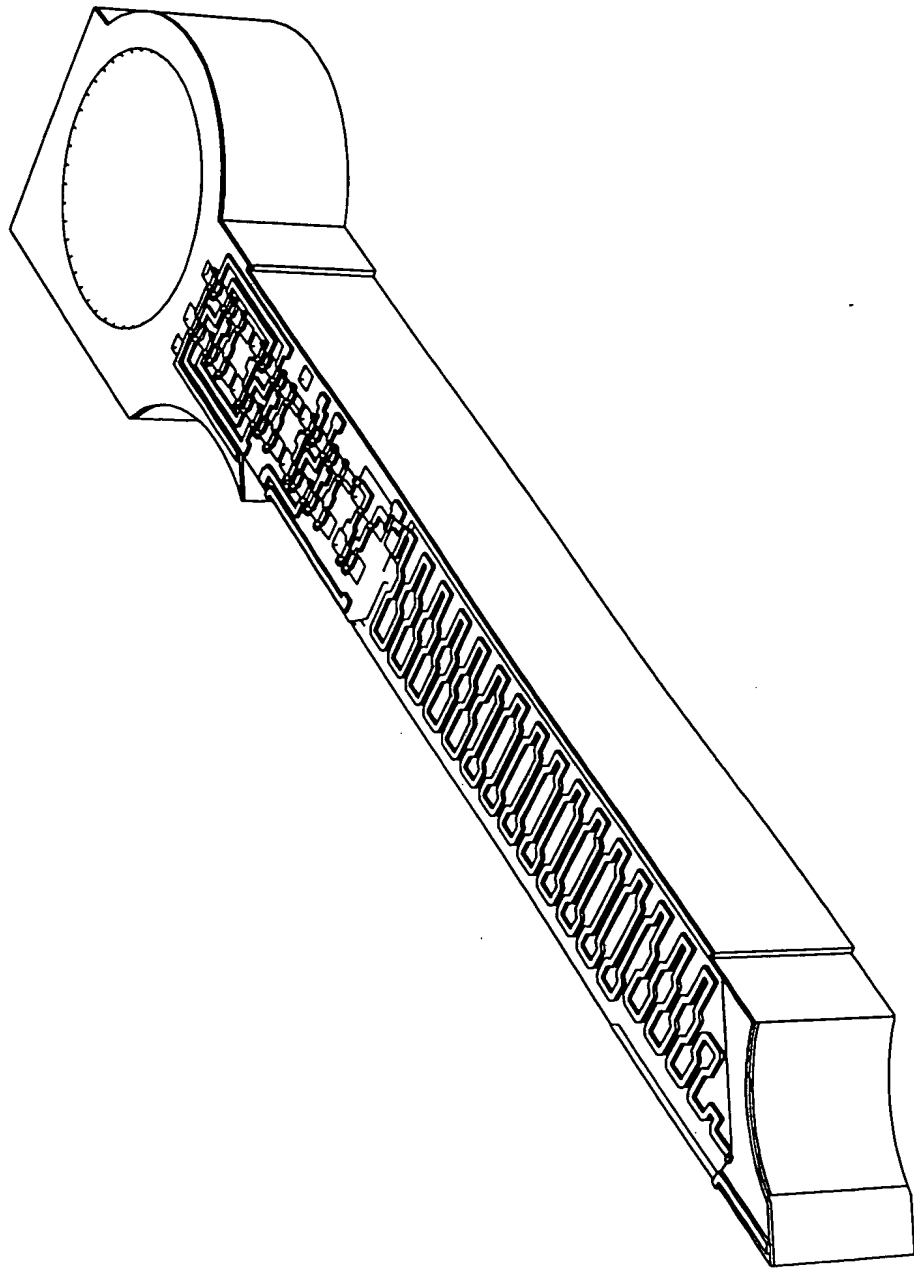
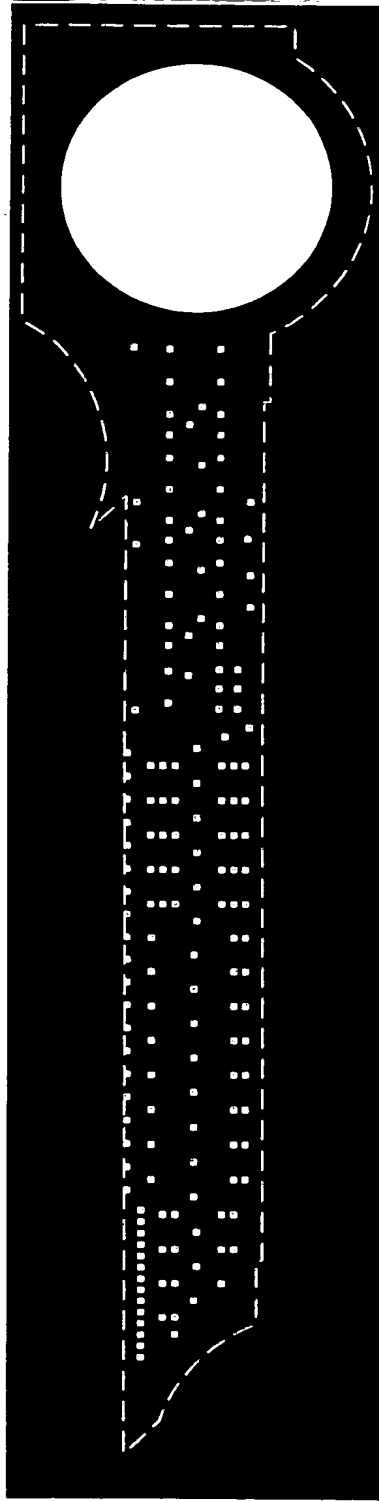
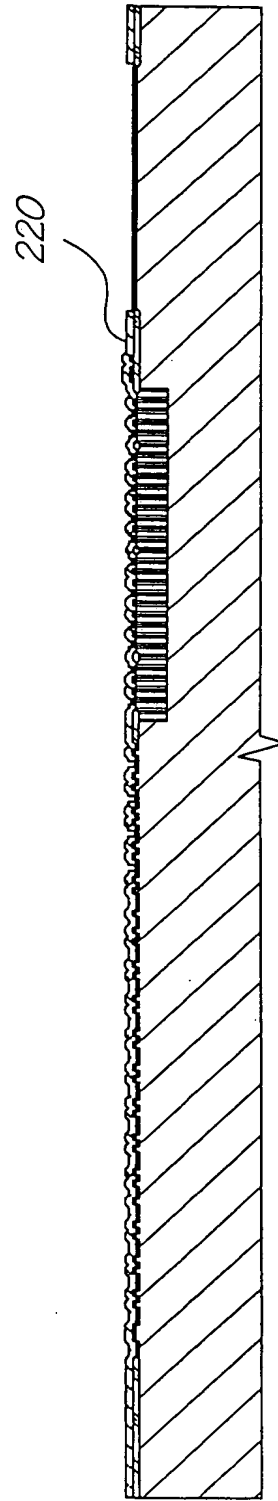


FIG. 33



Contacts mask

FIG. 34



Deposit ILD 1, etch contacts

FIG. 35

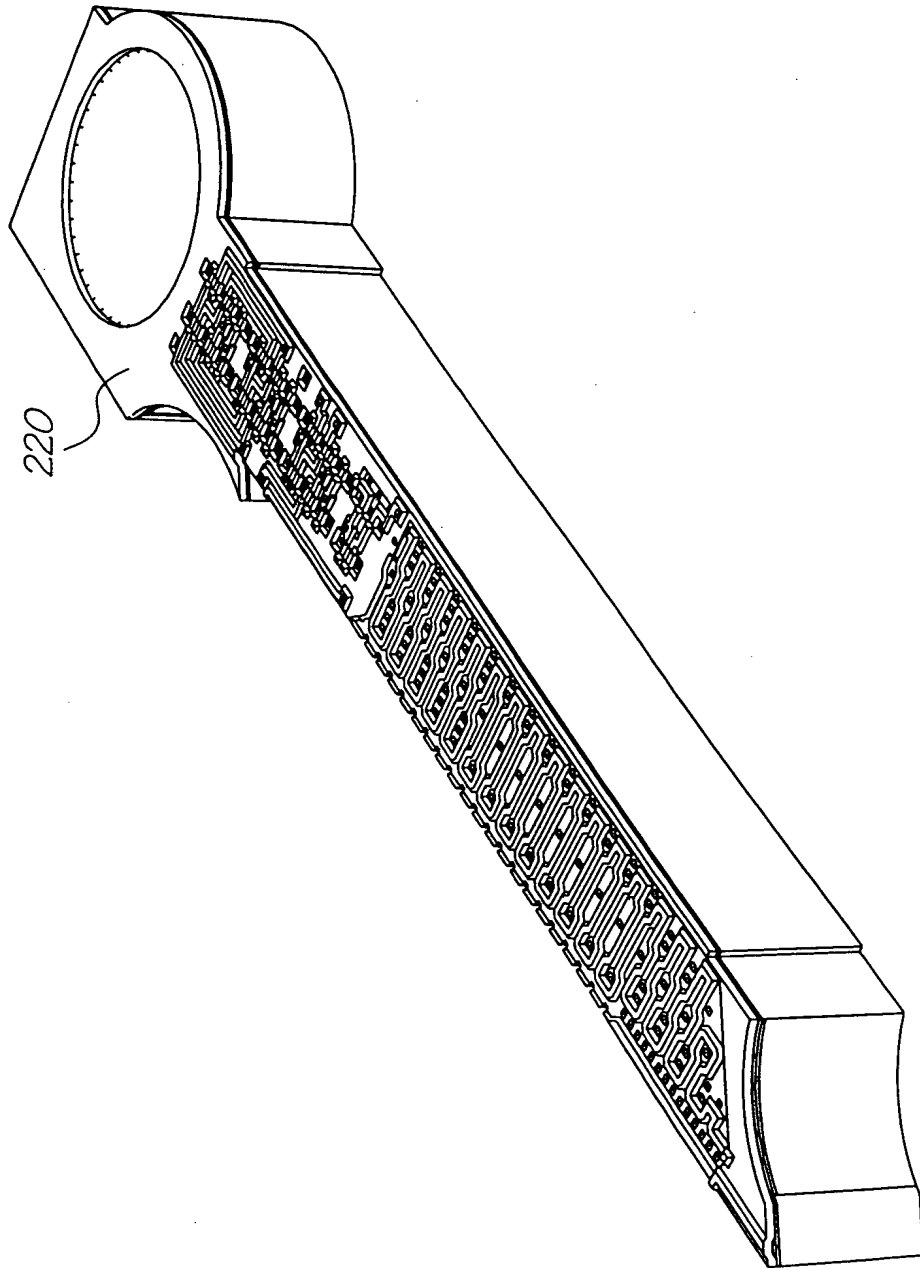
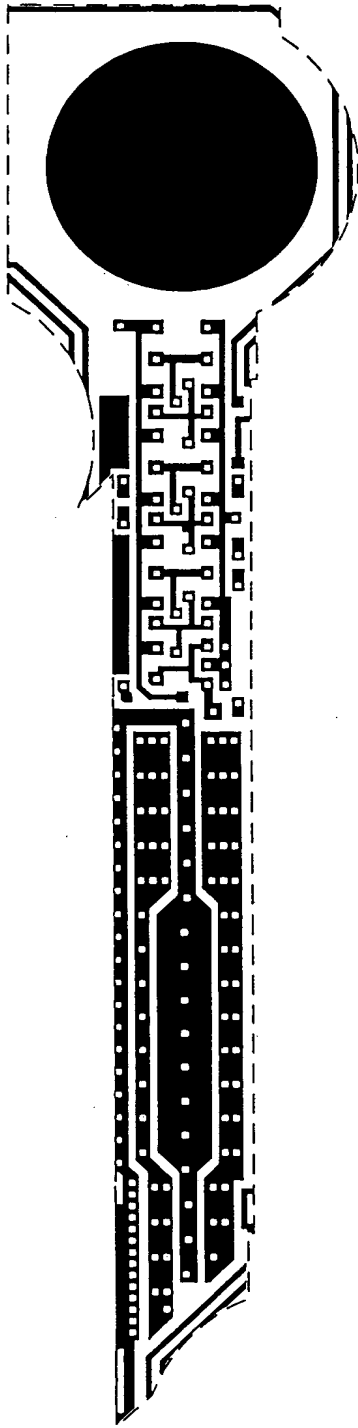
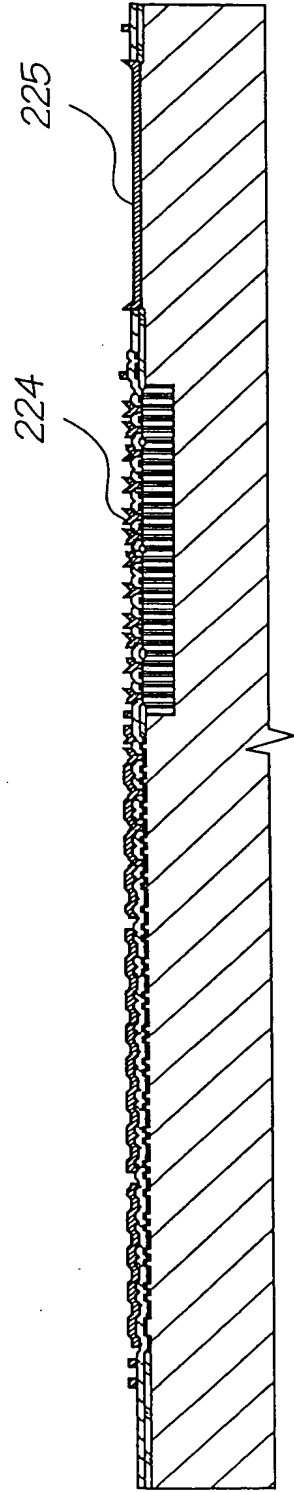


FIG. 36



Metal 1 mask

FIG. 37



Deposit Metal 1

FIG. 38



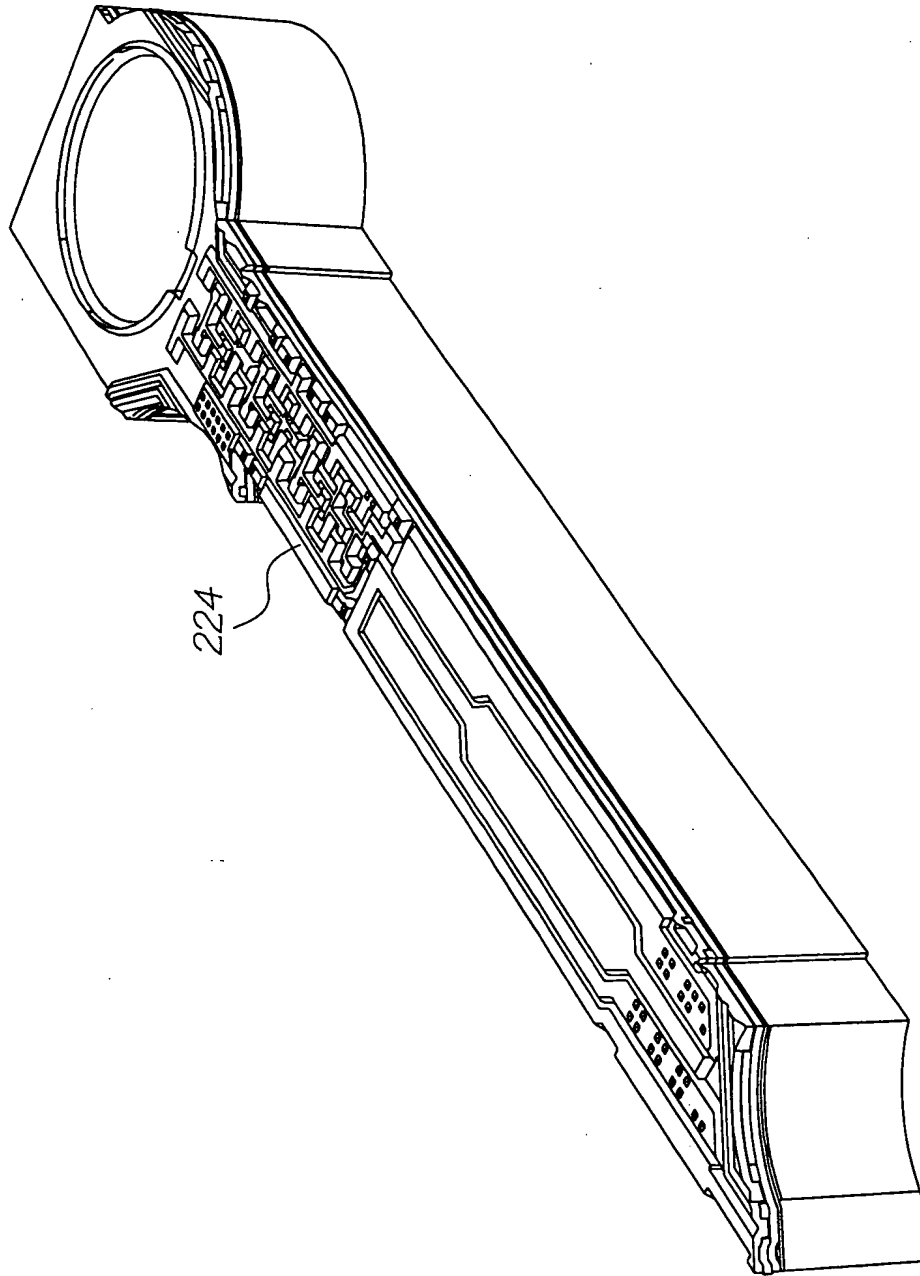
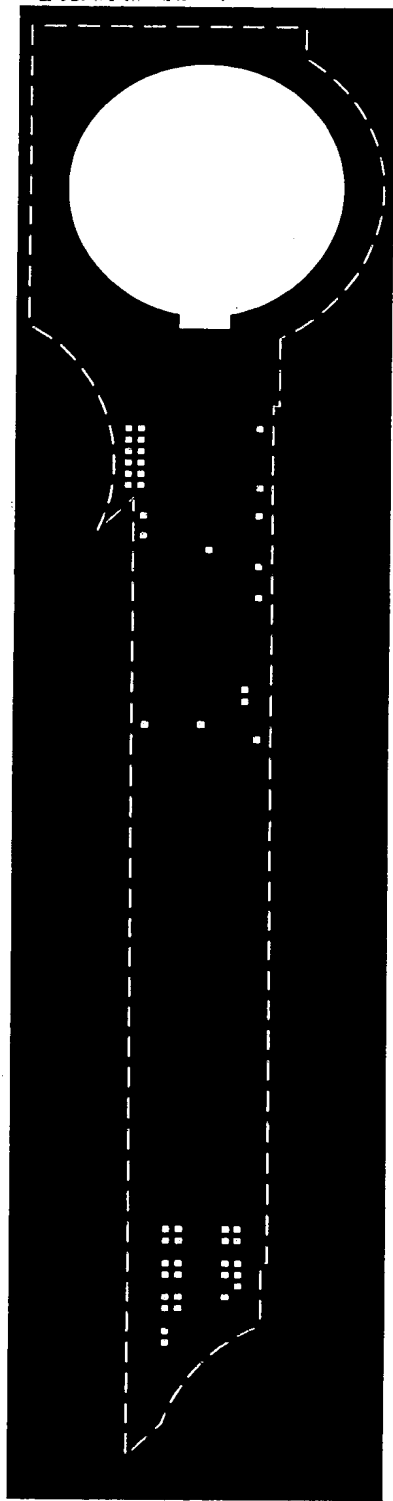
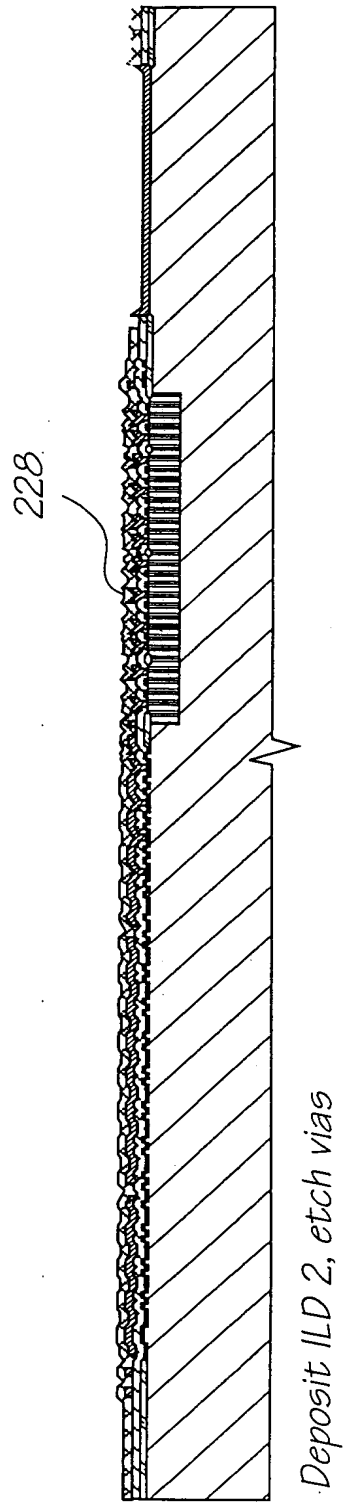


FIG. 39



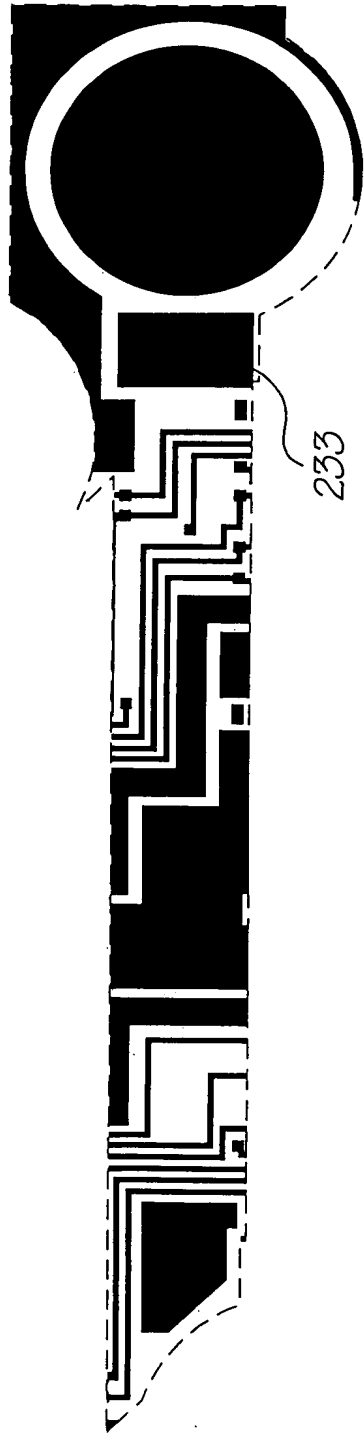
Via 1 mask

FIG. 40



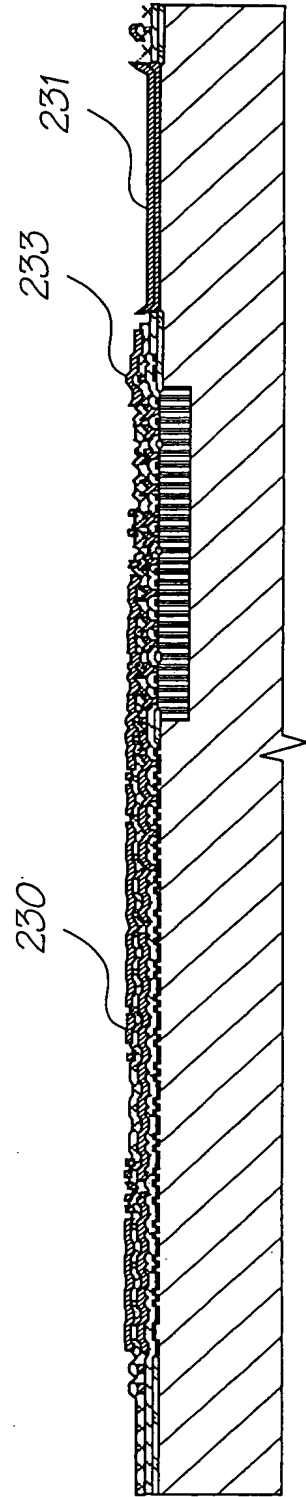
Deposit ILD 2, etch vias

FIG. 41



Metal 2 mask

FIG. 42



Deposit metal 2

FIG. 43

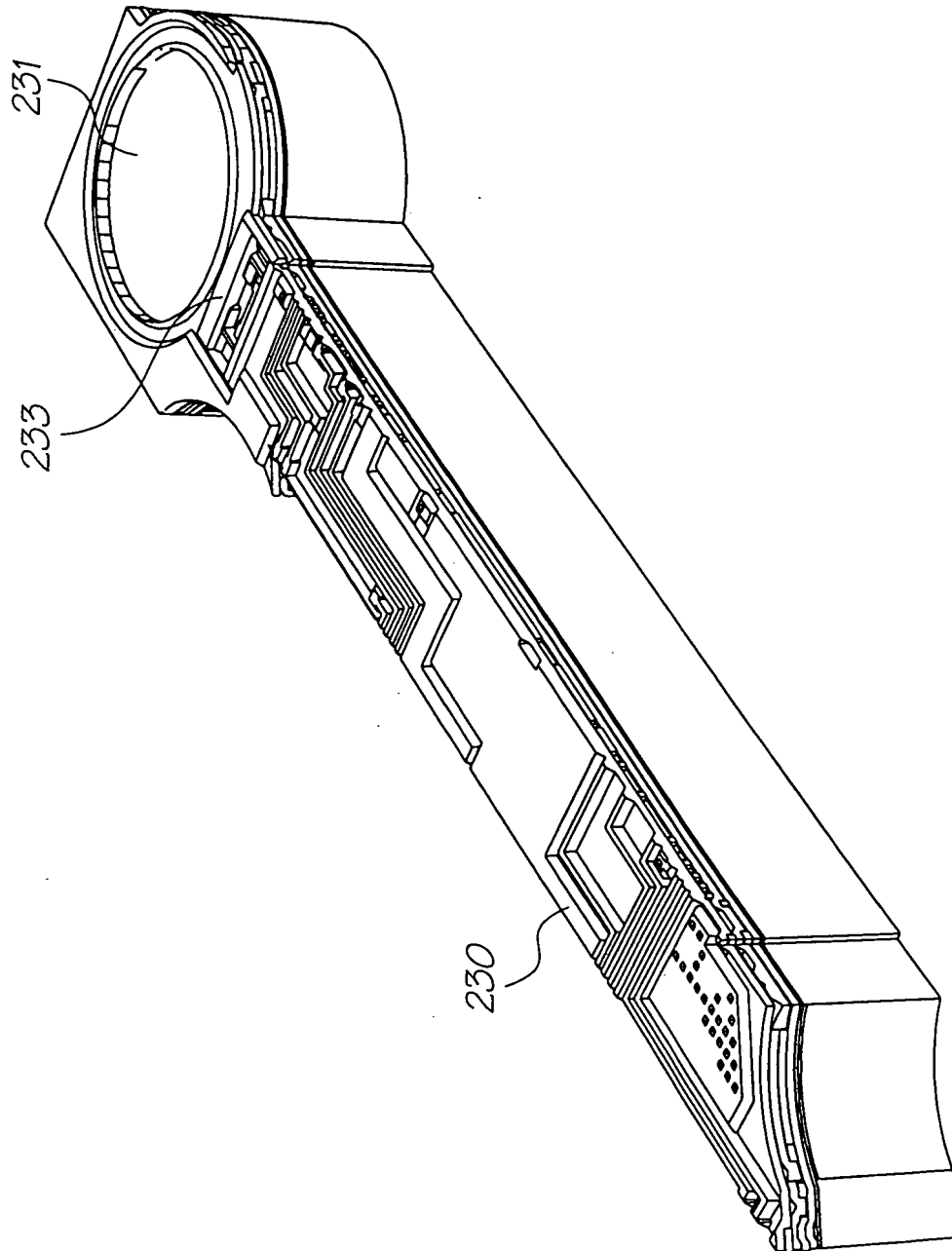


FIG. 44

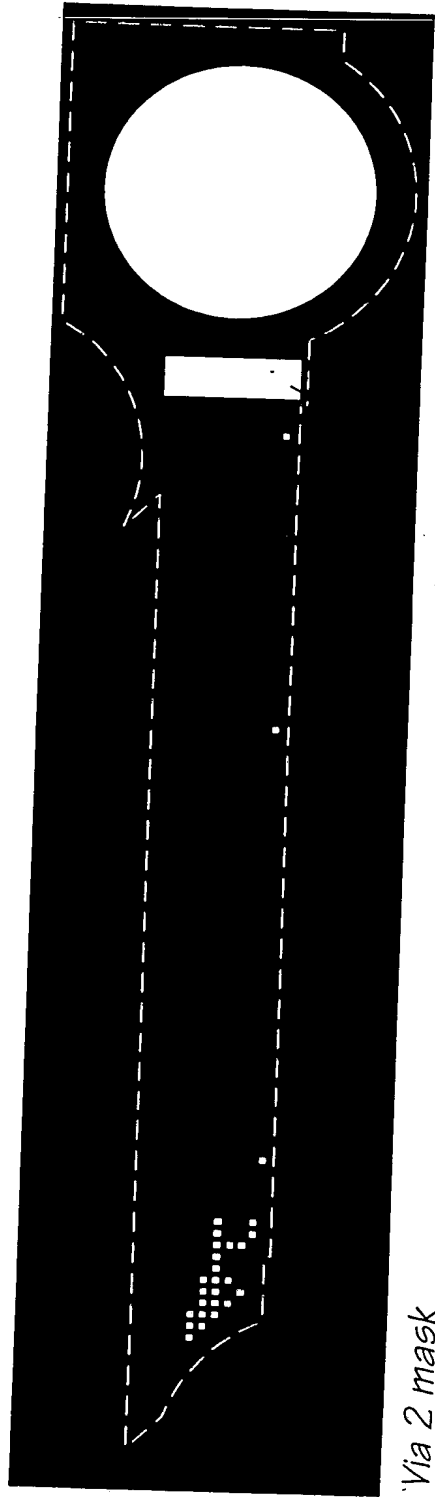


FIG. 45

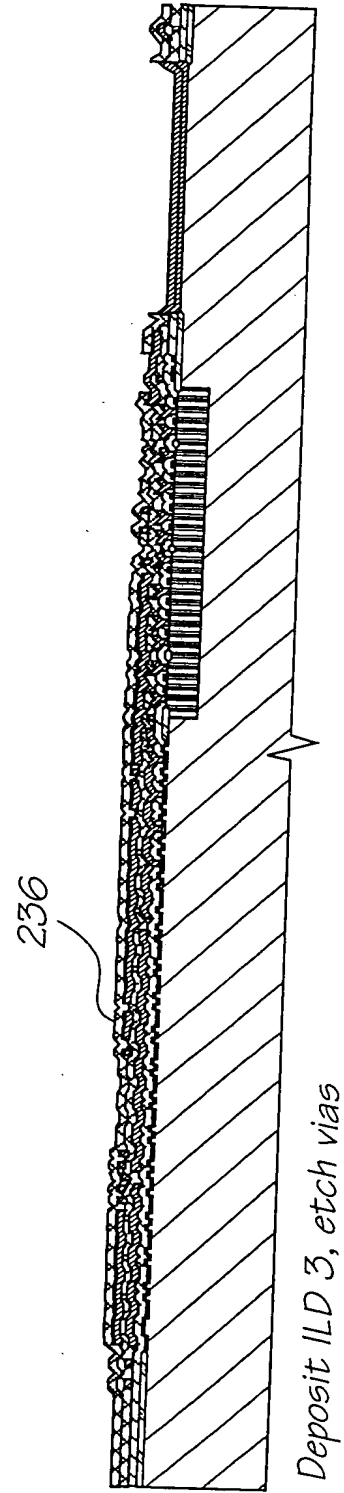
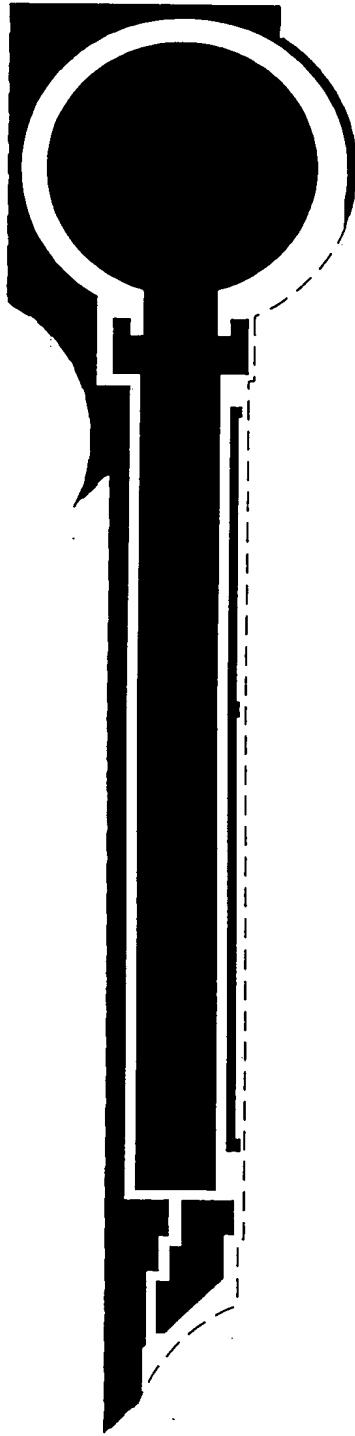
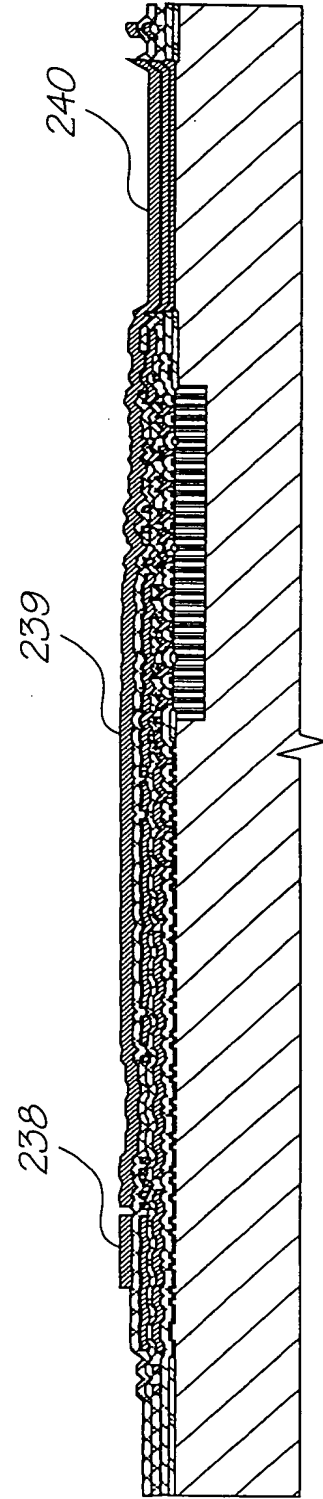


FIG. 46



Metal 3 mask

FIG. 47



Deposit metal 3

FIG. 48

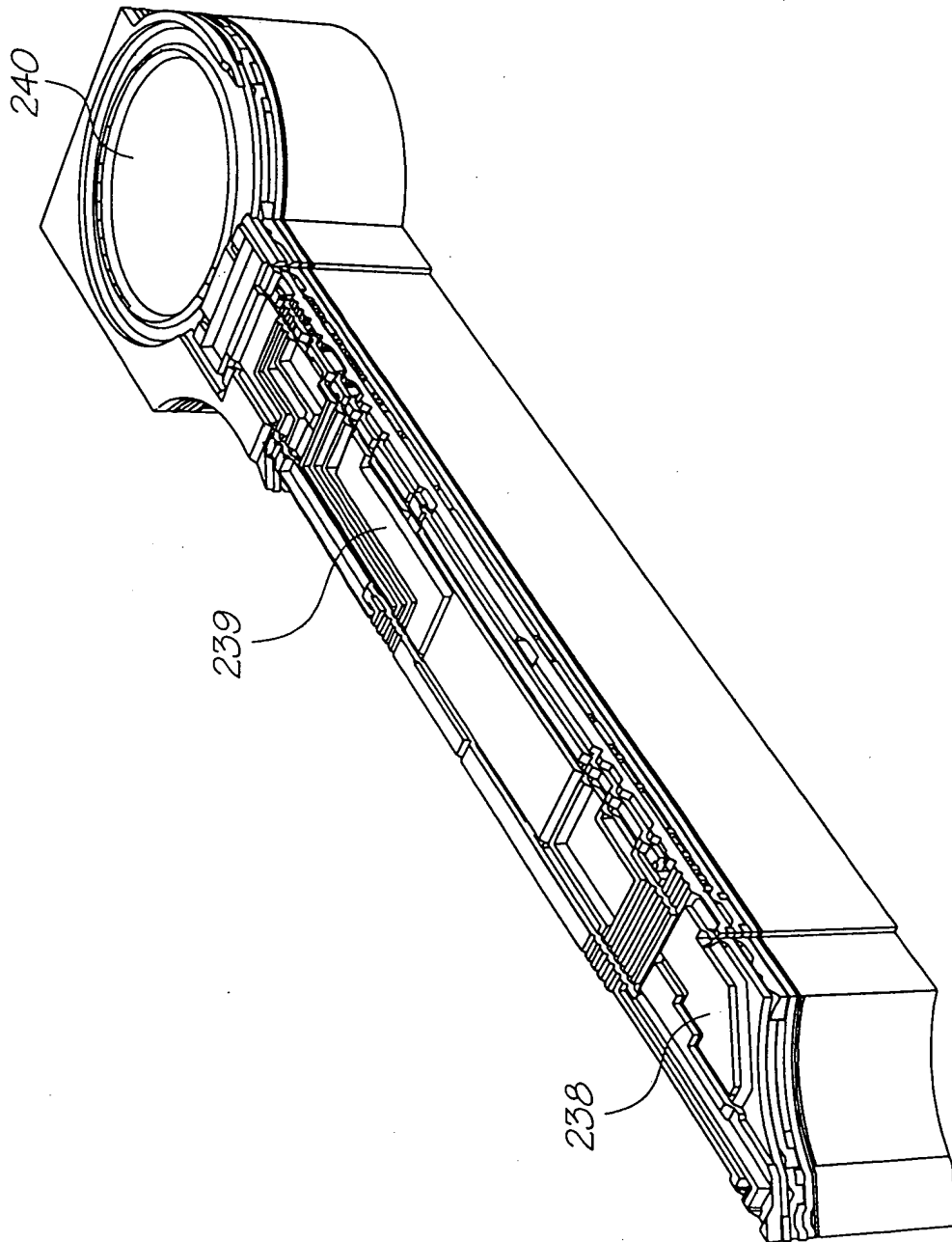
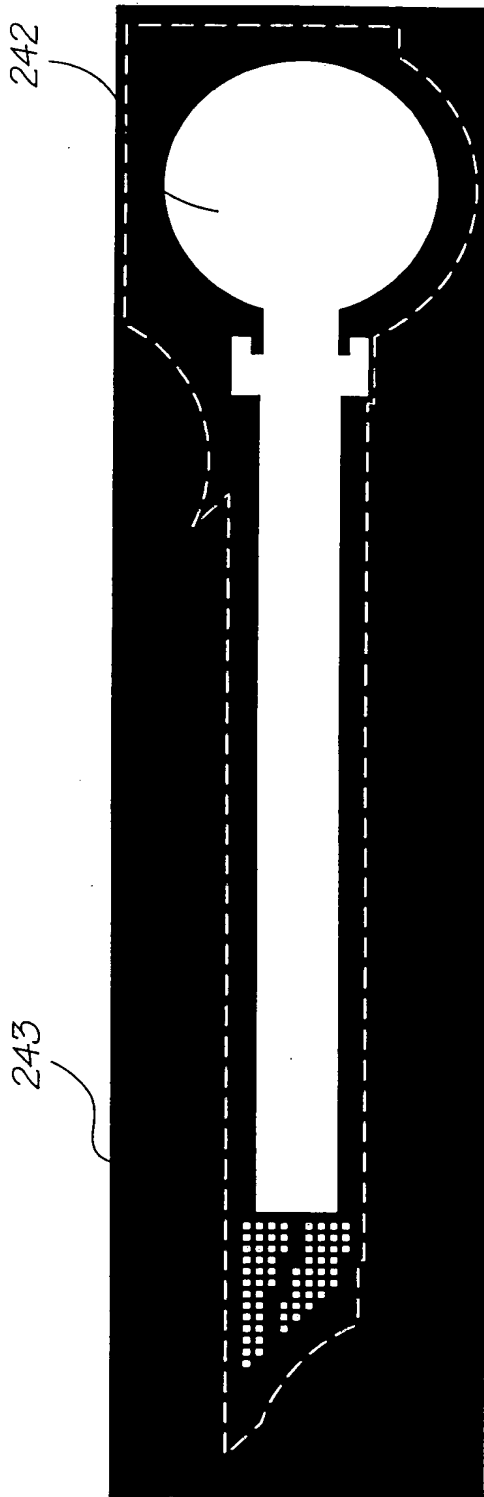
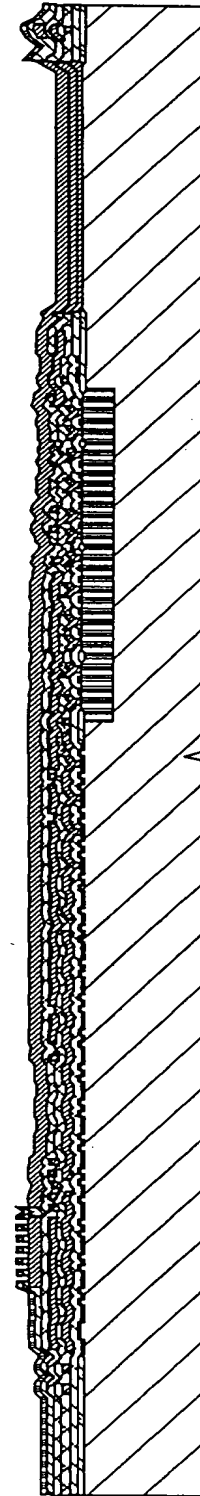


FIG. 49



Via 3 / Passivation mask

FIG. 50



Deposit passivation oxide & nitride, etch vias

FIG. 51



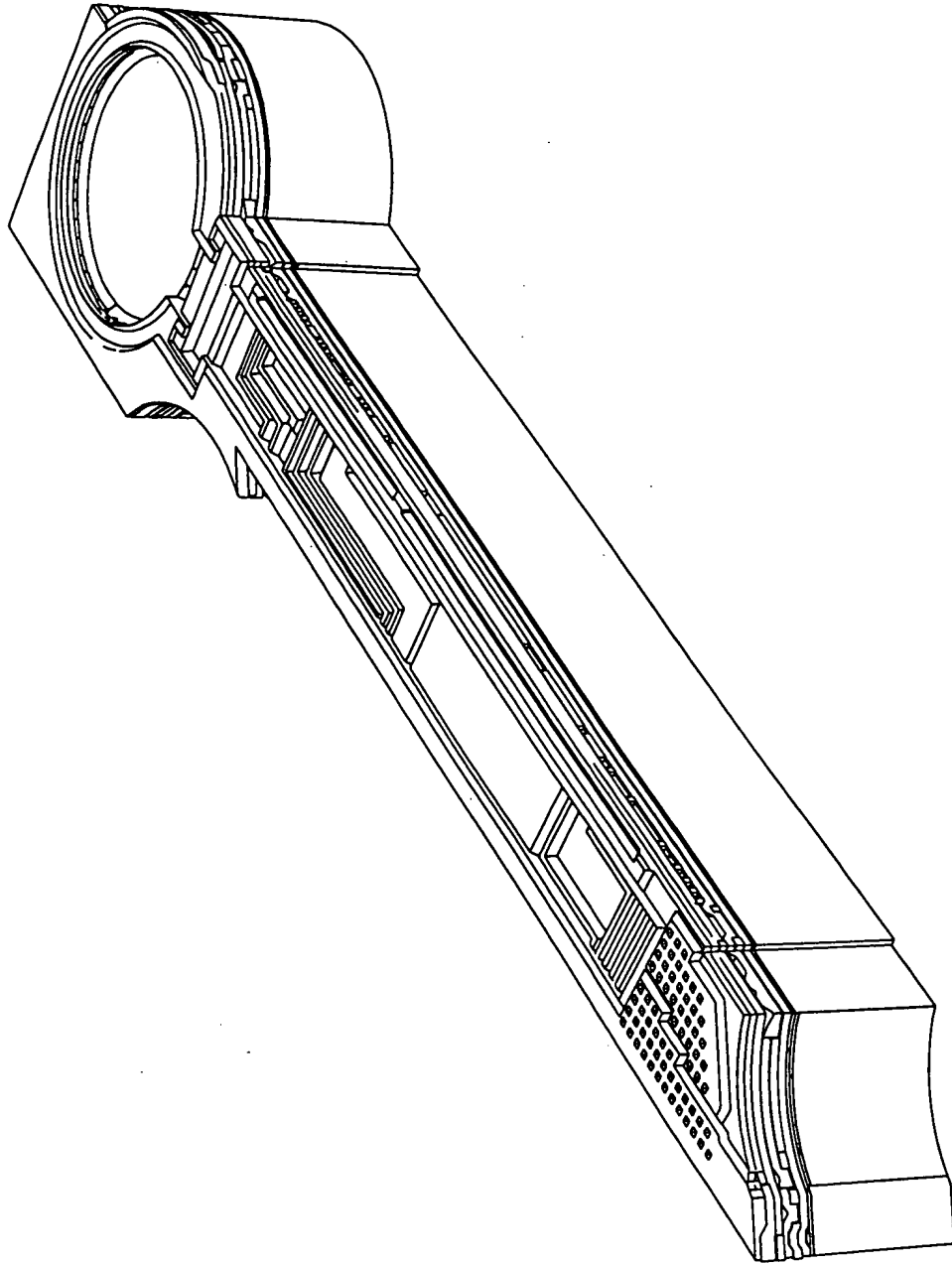
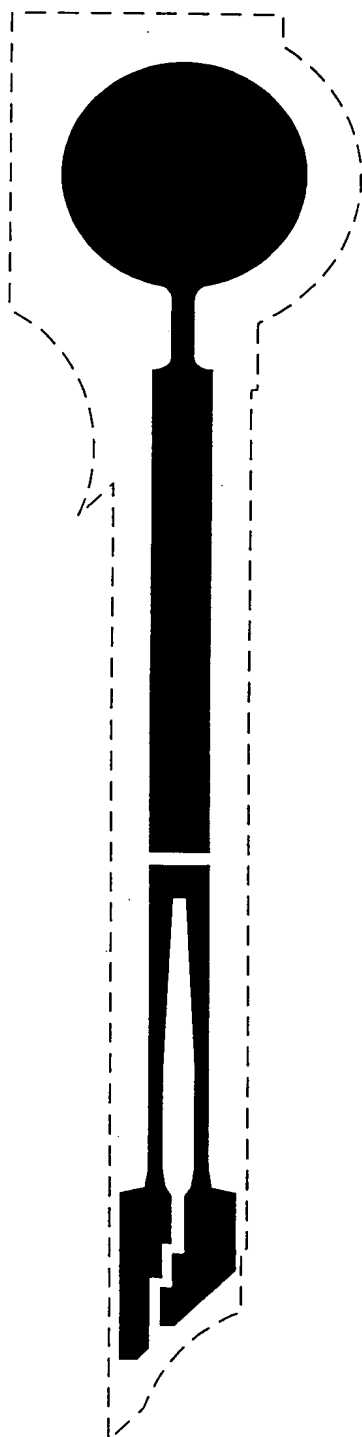
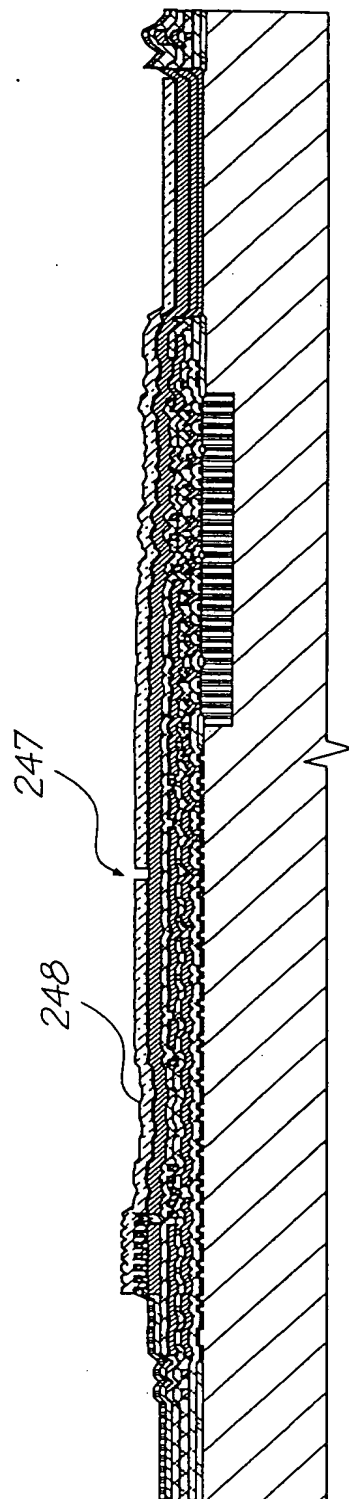


FIG. 52



Heater mask

FIG. 53



Deposit heater TiN

FIG. 54

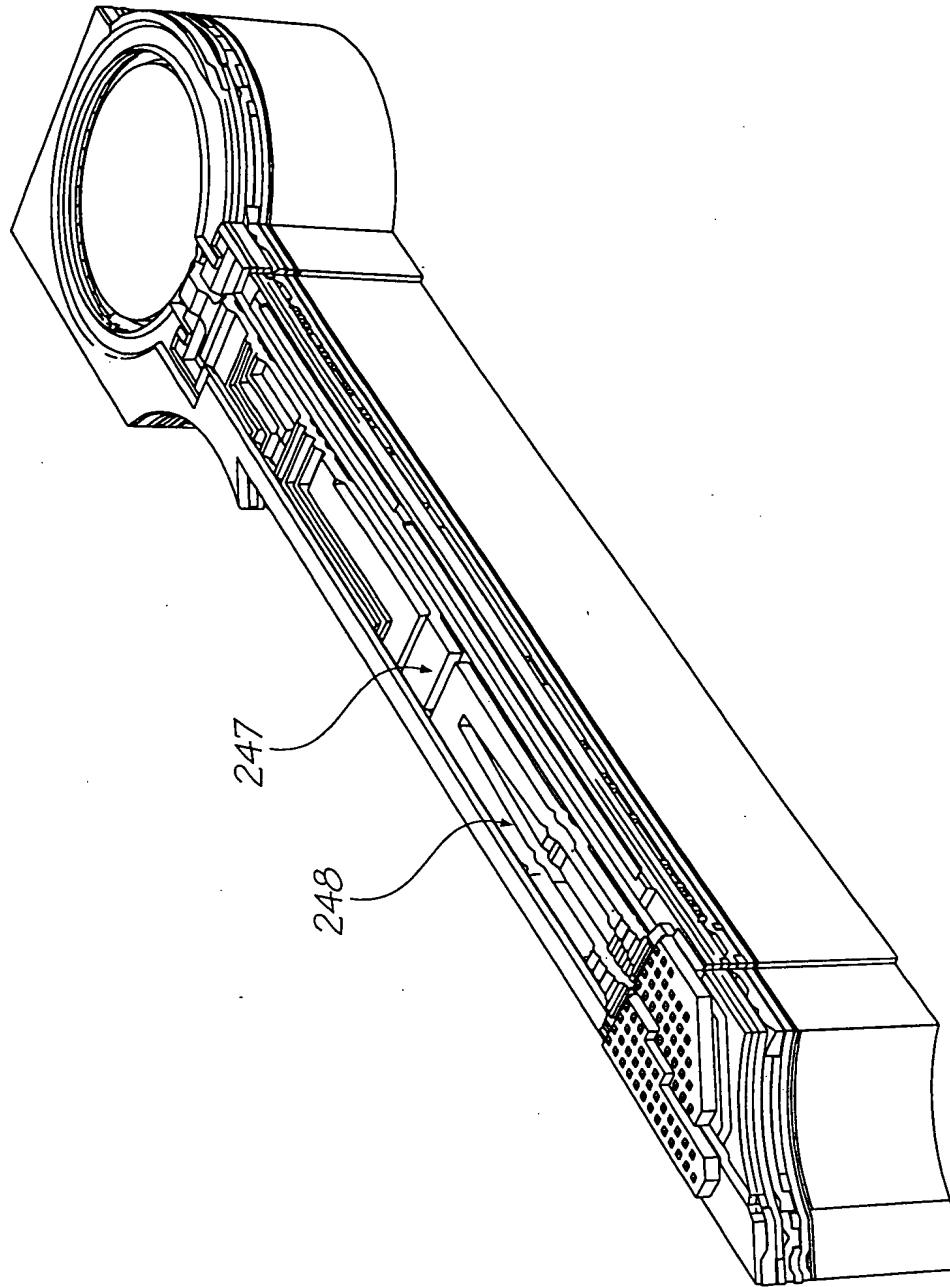
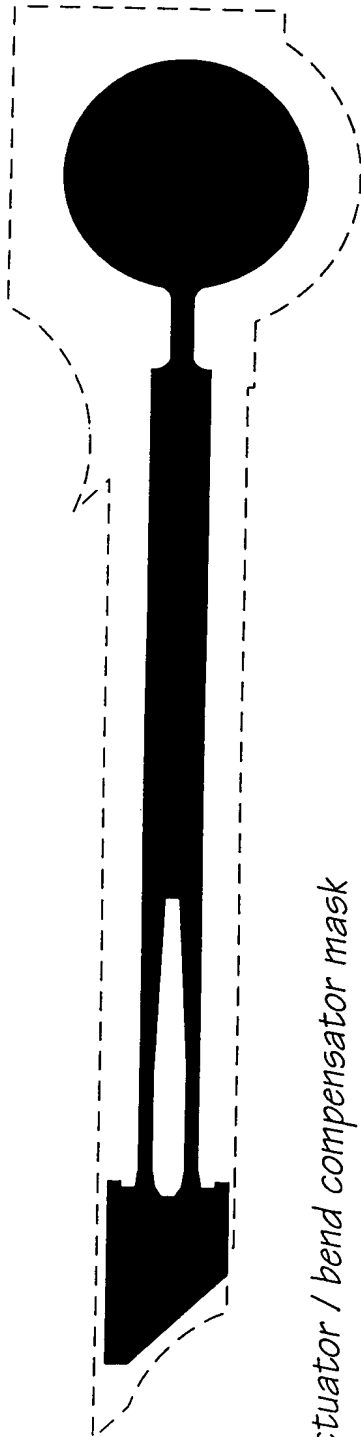
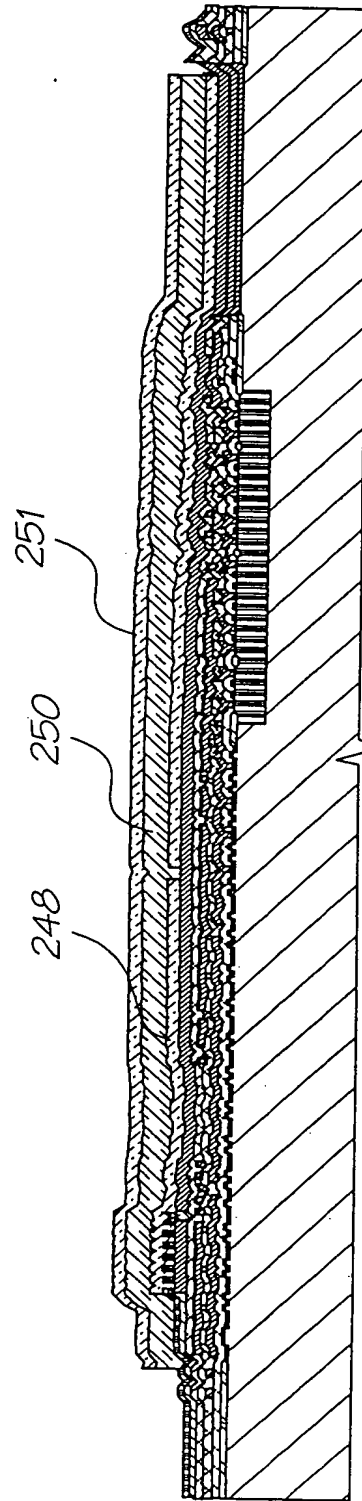


FIG. 55



Actuator / bend compensator mask

FIG. 56



Deposit actuator glass and bend compensator TiN, etch together

FIG. 57

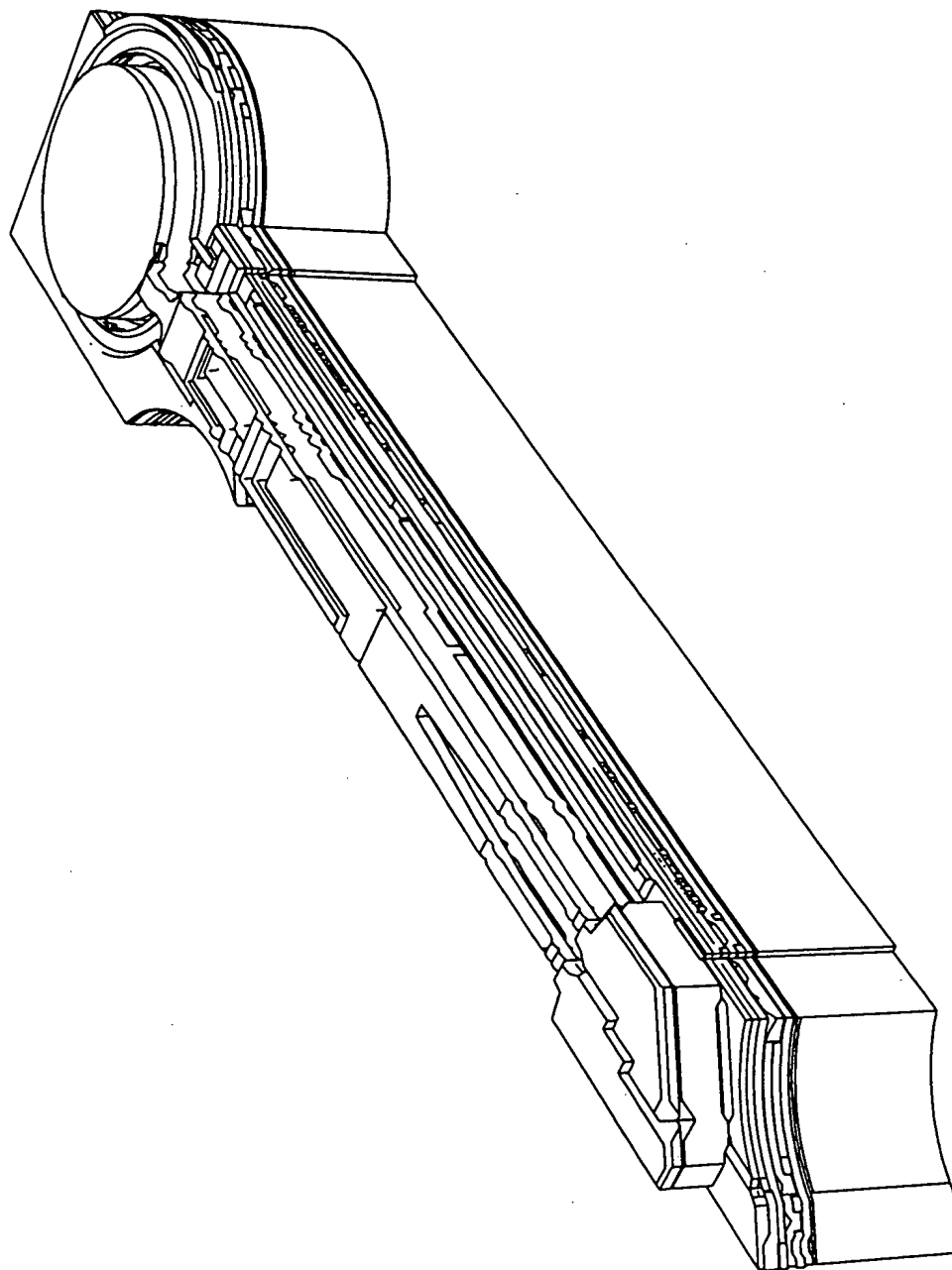
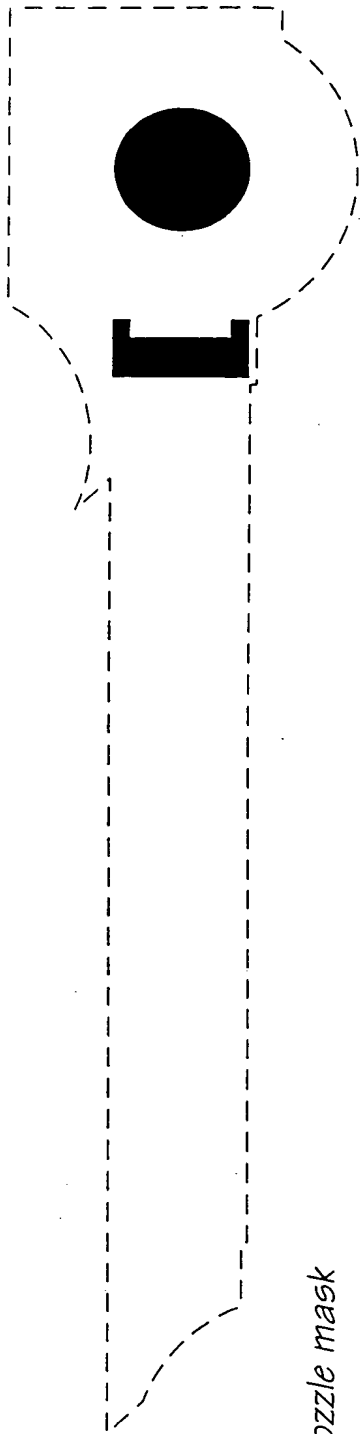
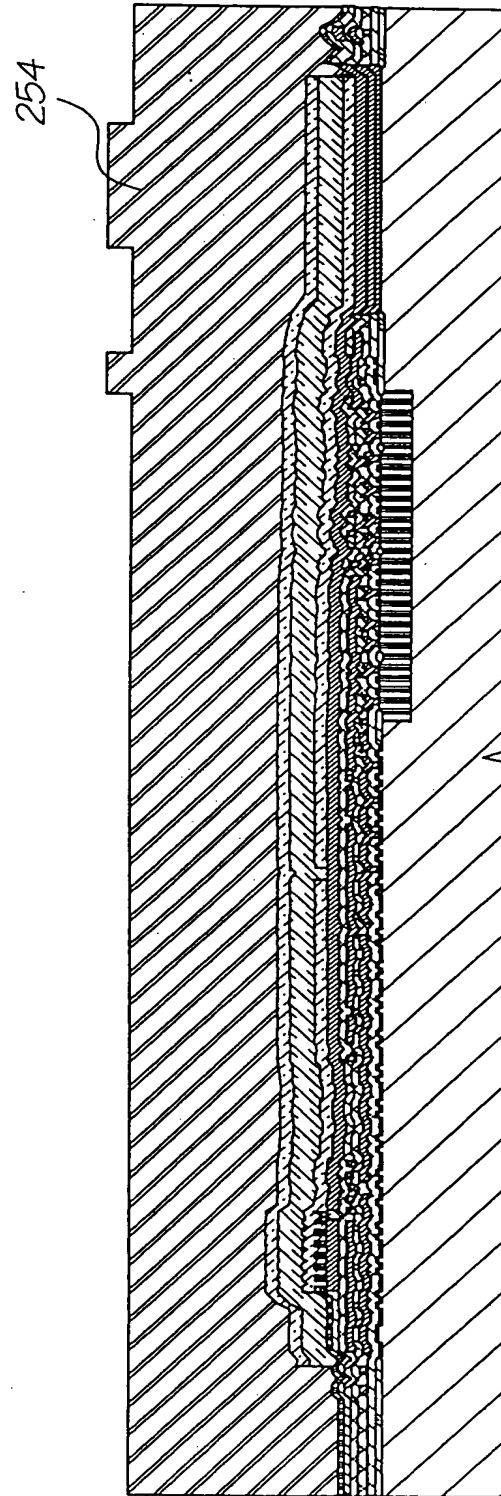


FIG. 58



Nozzle mask

FIG. 59



Deposit sacrificial layer, etch nozzles

FIG. 60

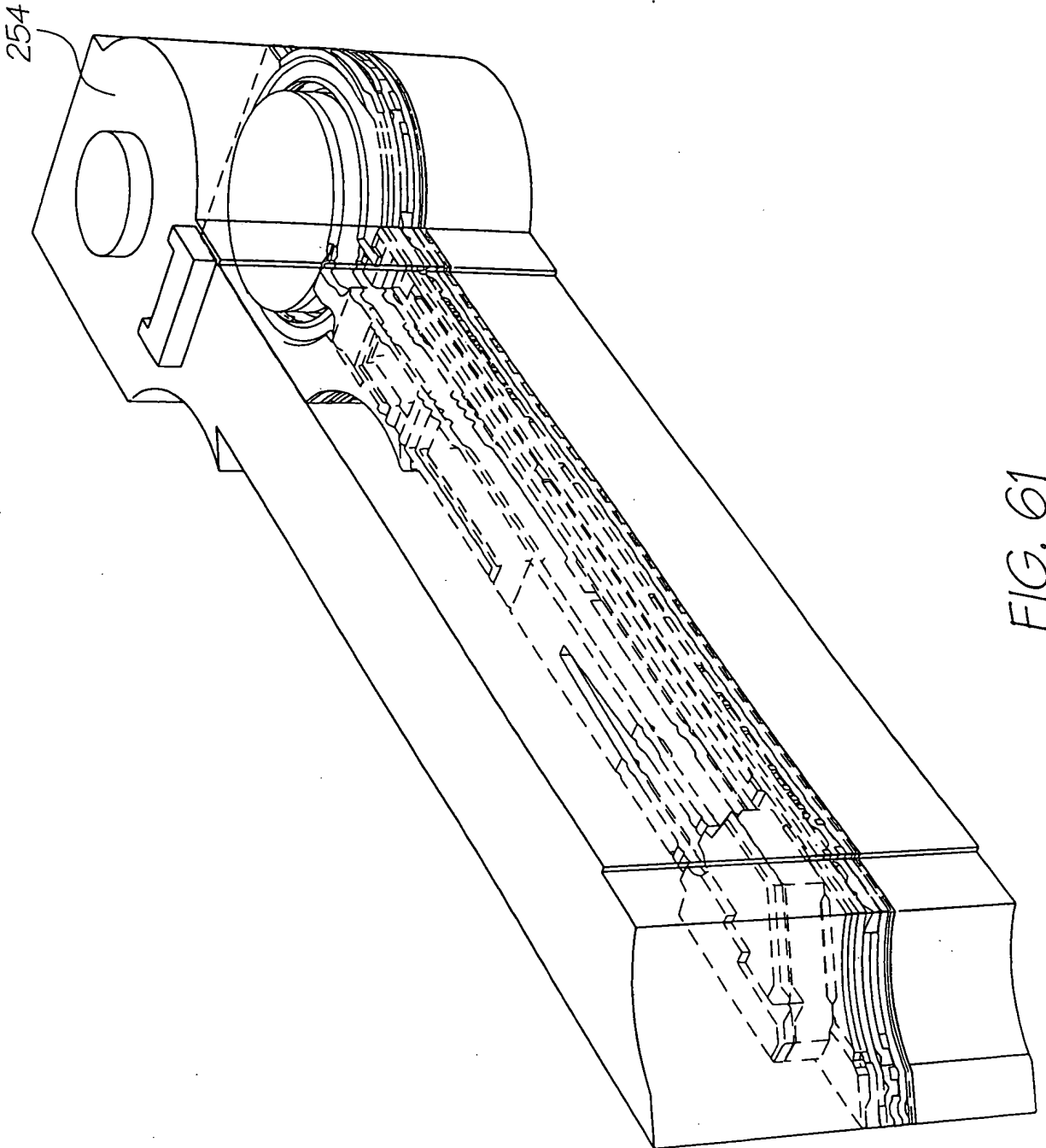


FIG. 61

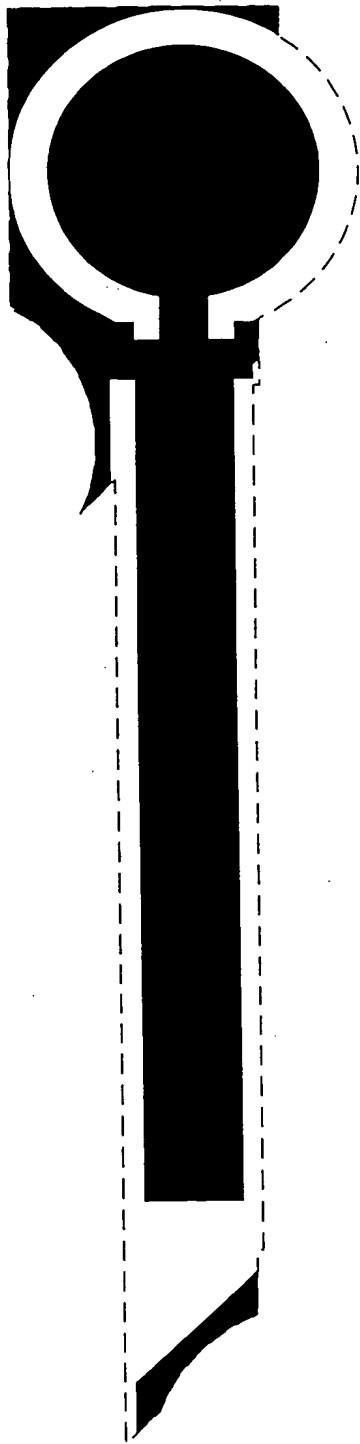


FIG. 62

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255

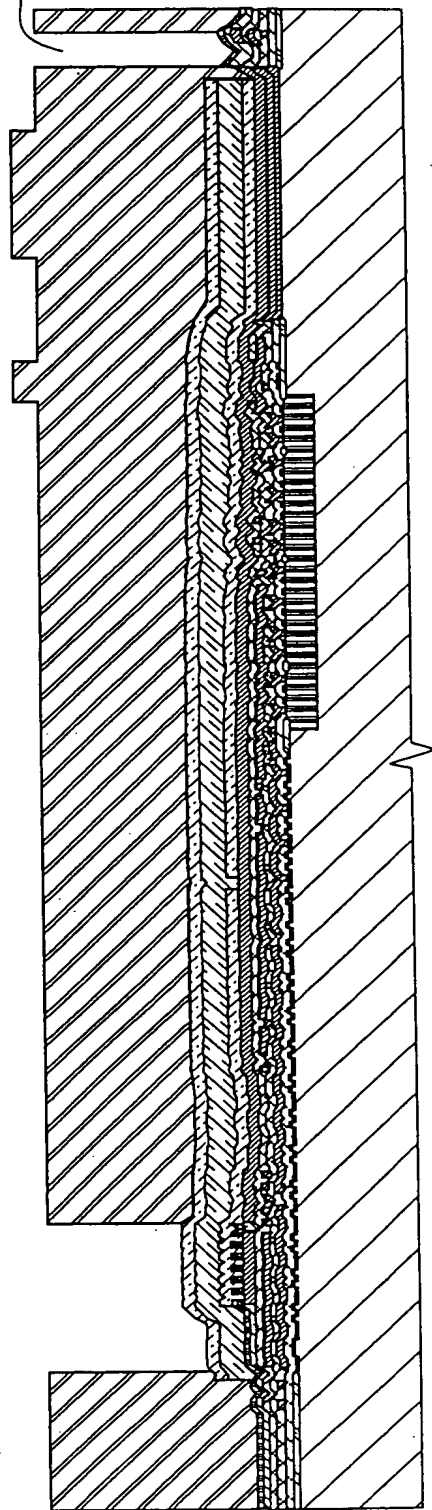


FIG. 63



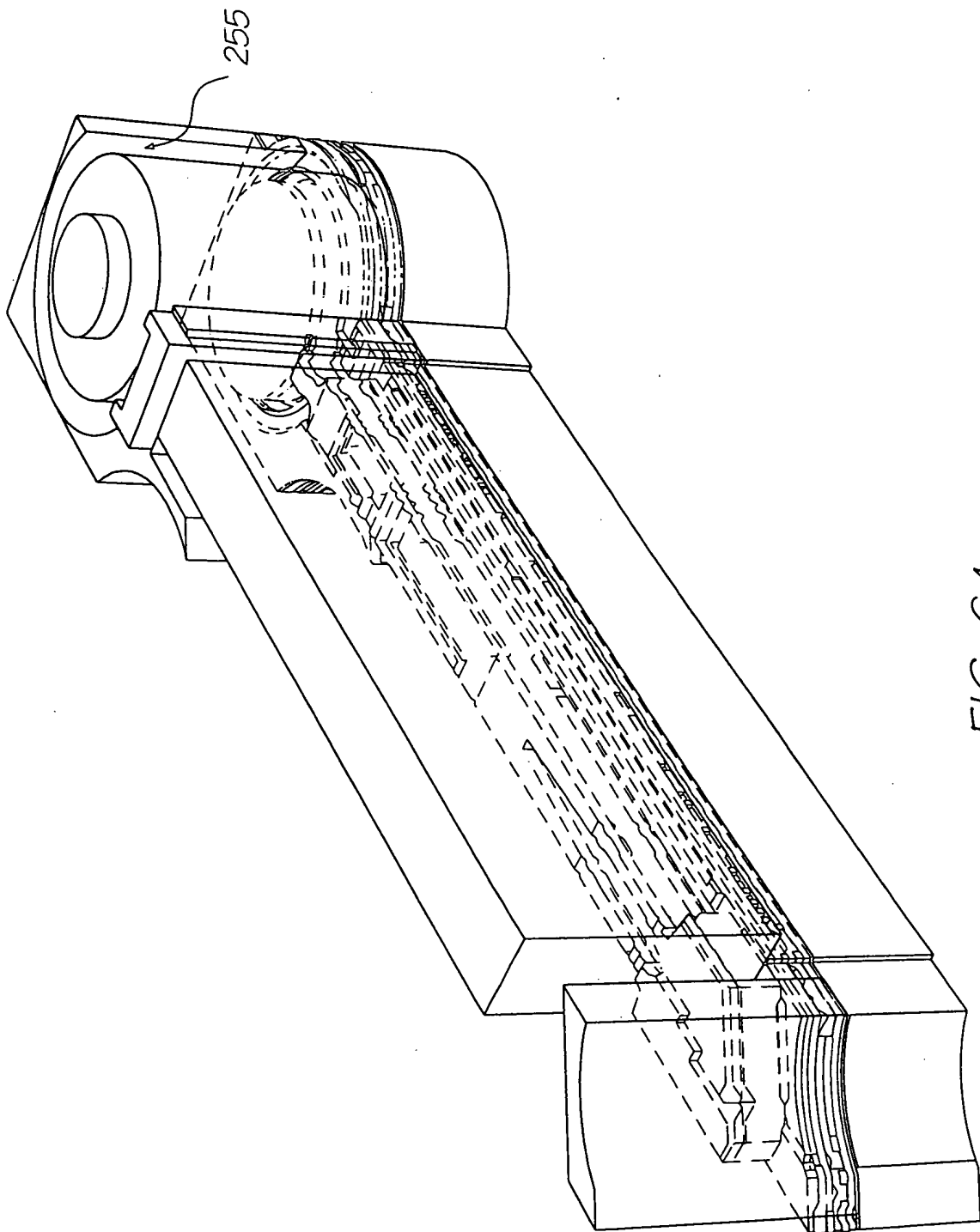
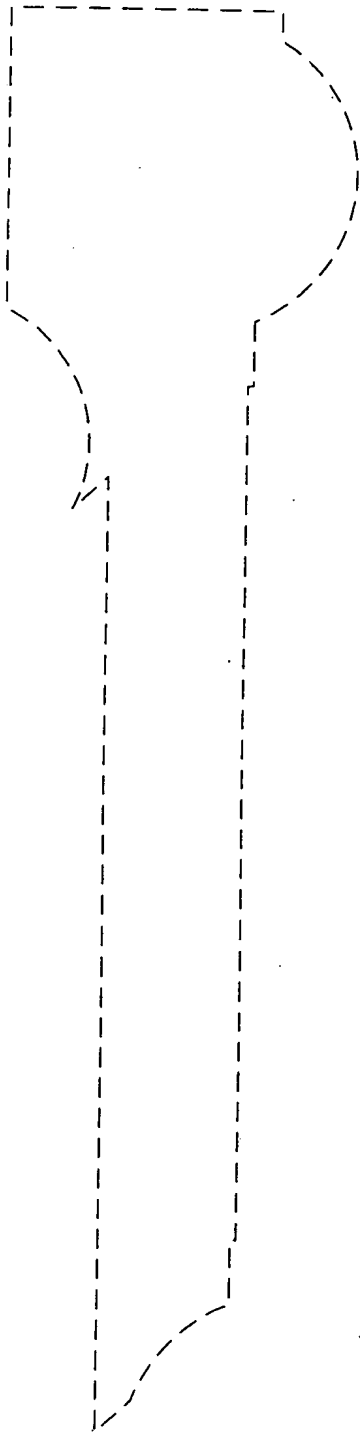
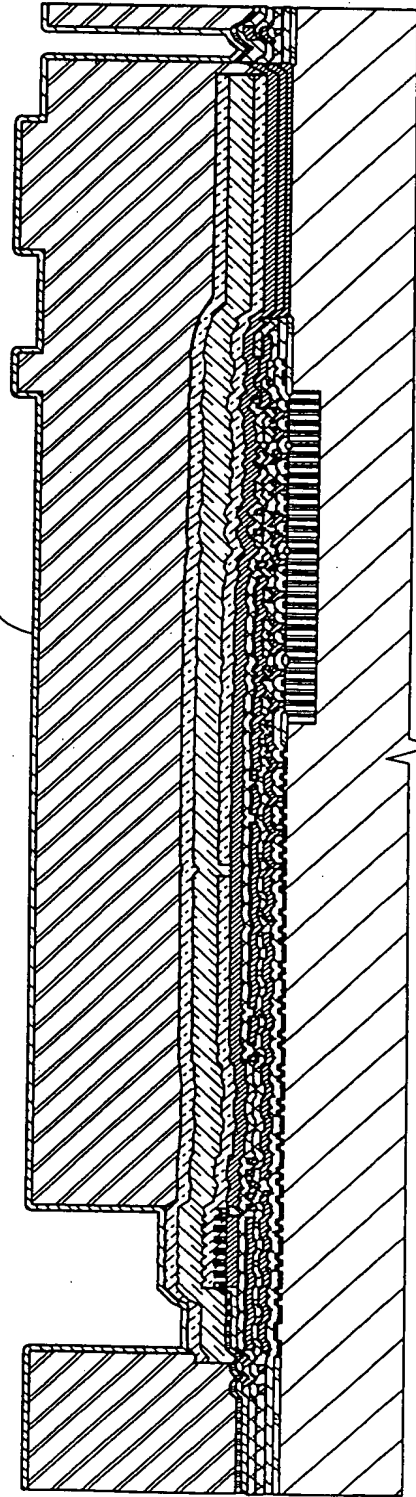


FIG. 64



No mask

257



Deposit chamber walls

FIG. 65

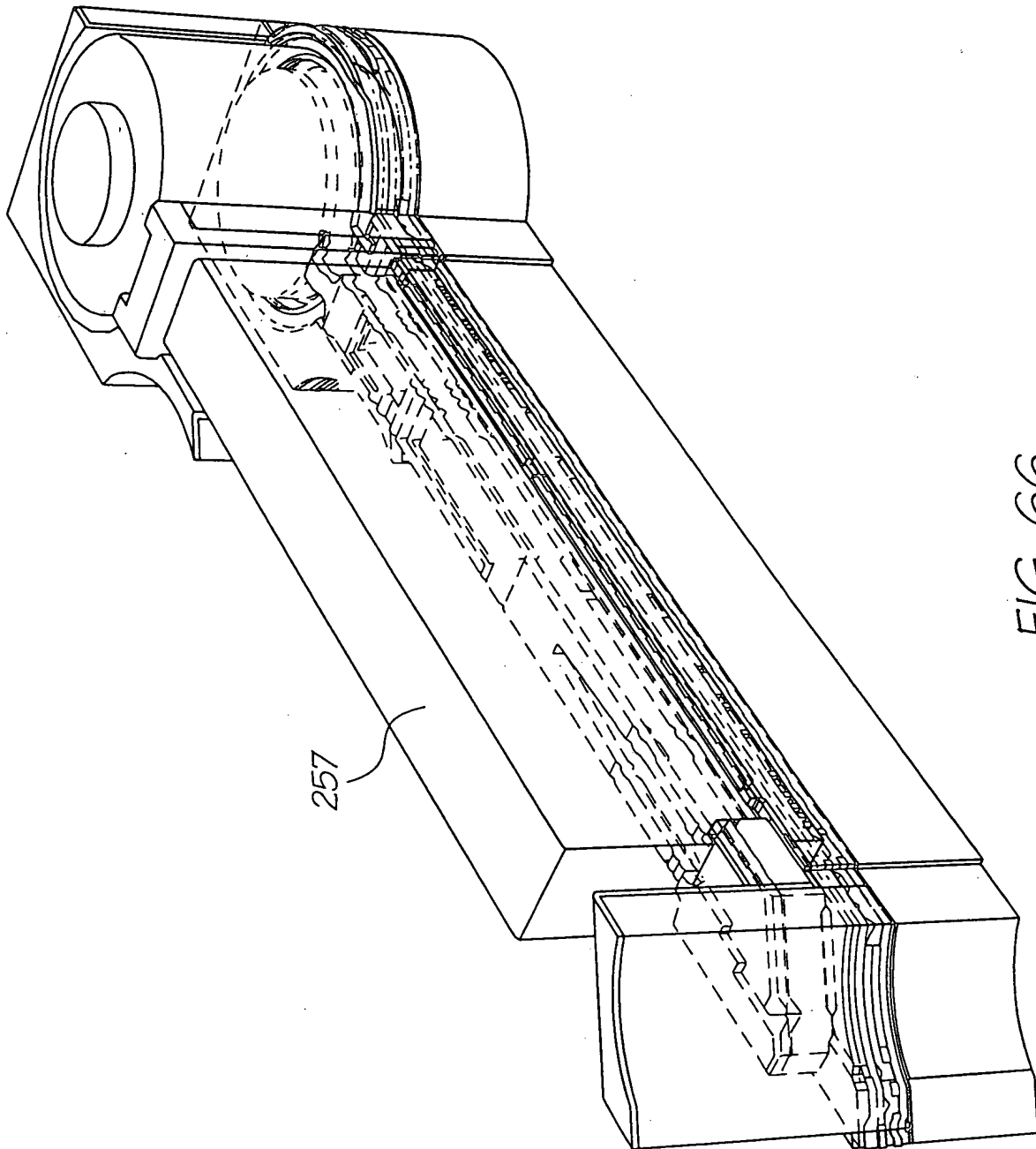
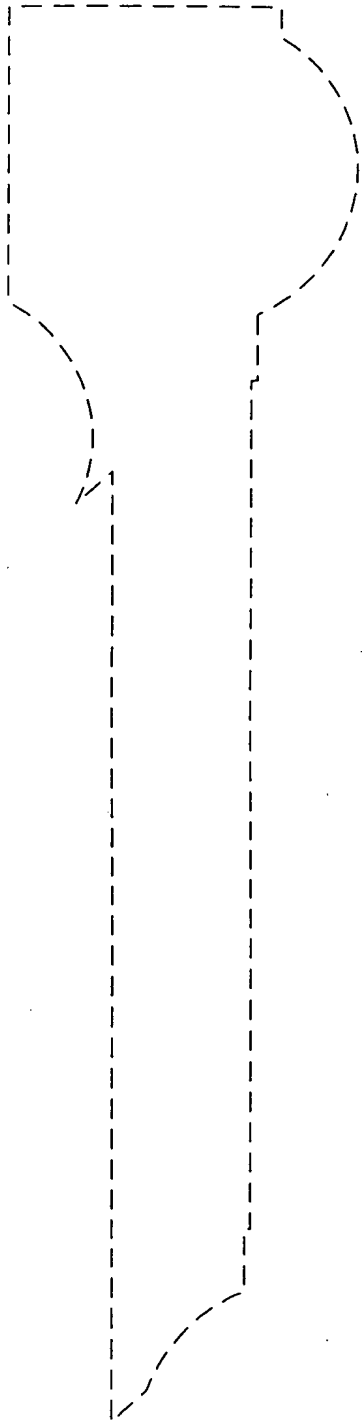
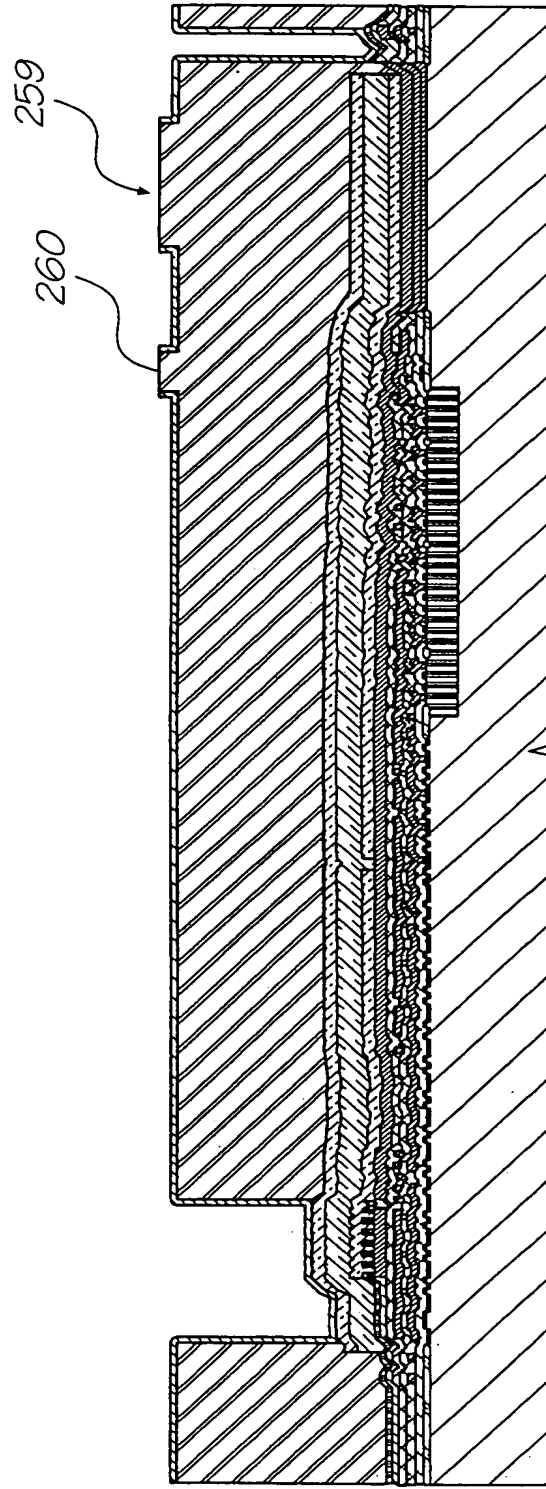


FIG. 66

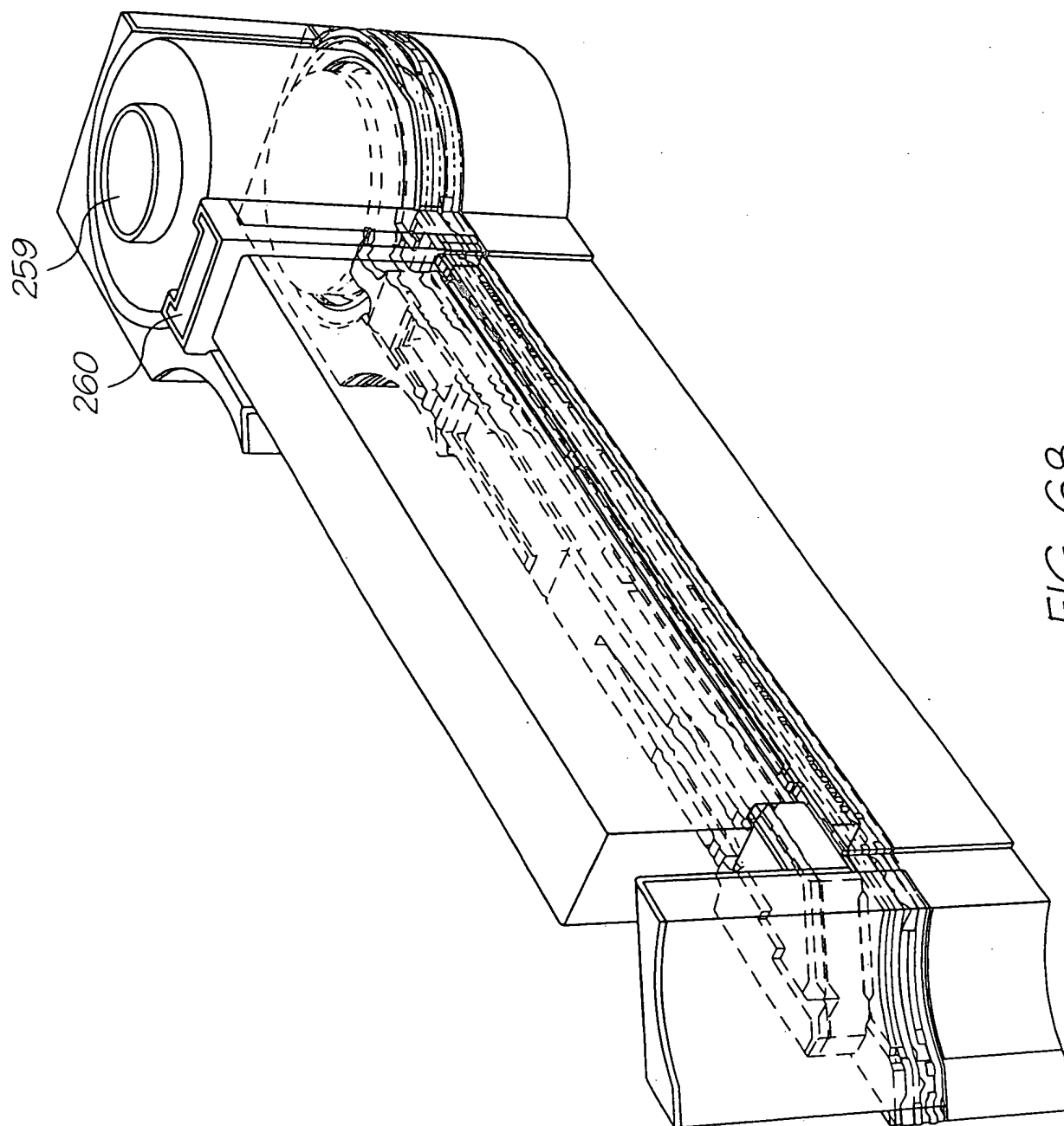


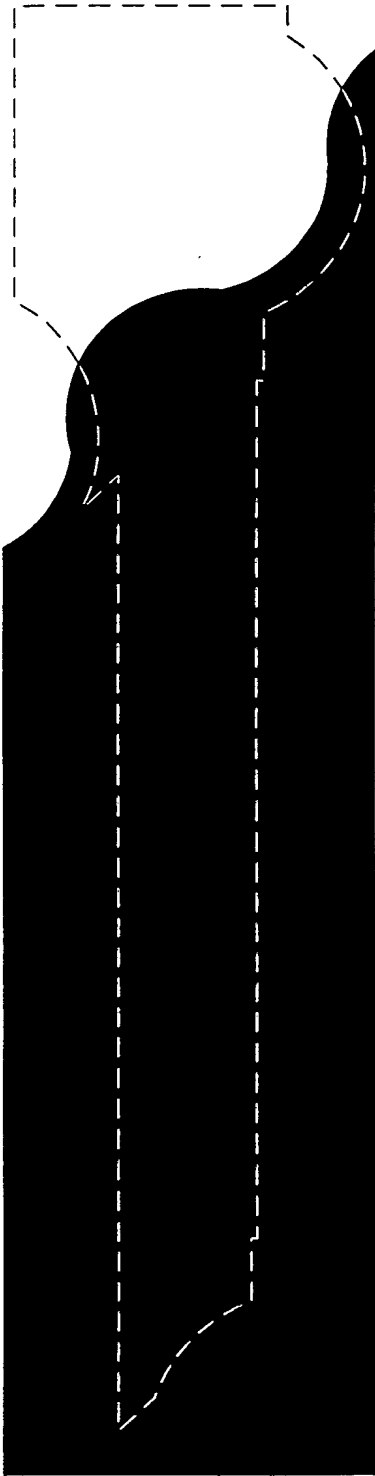
No mask



Form self-aligned nozzles using CMP

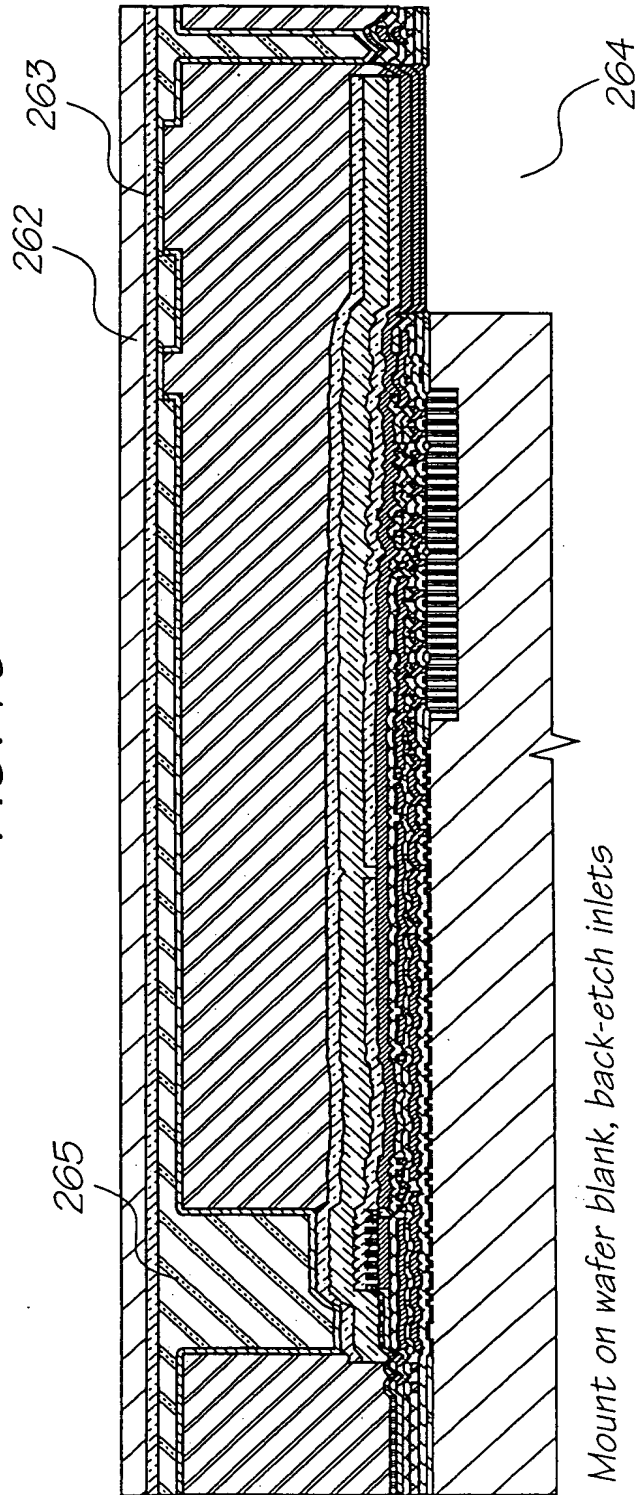
FIG. 67





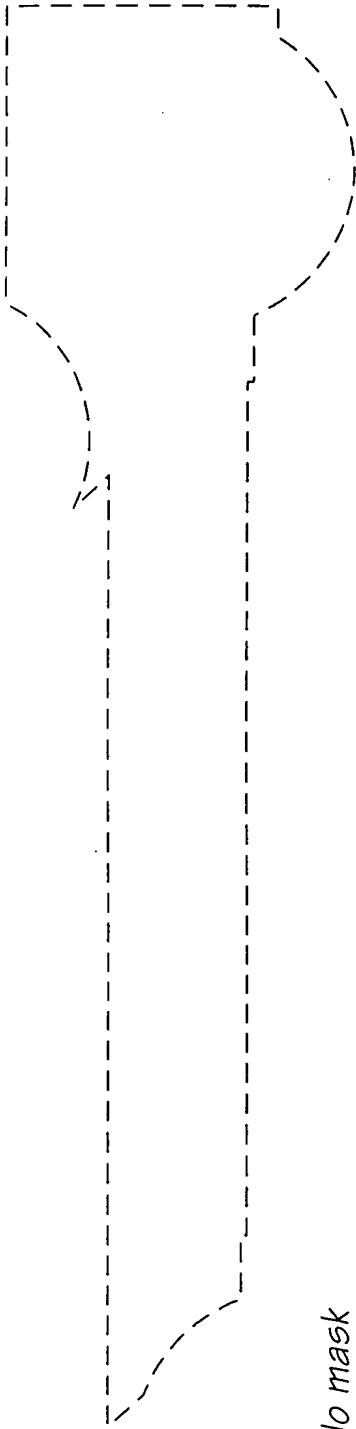
Back-etch inlet mask

FIG. 70

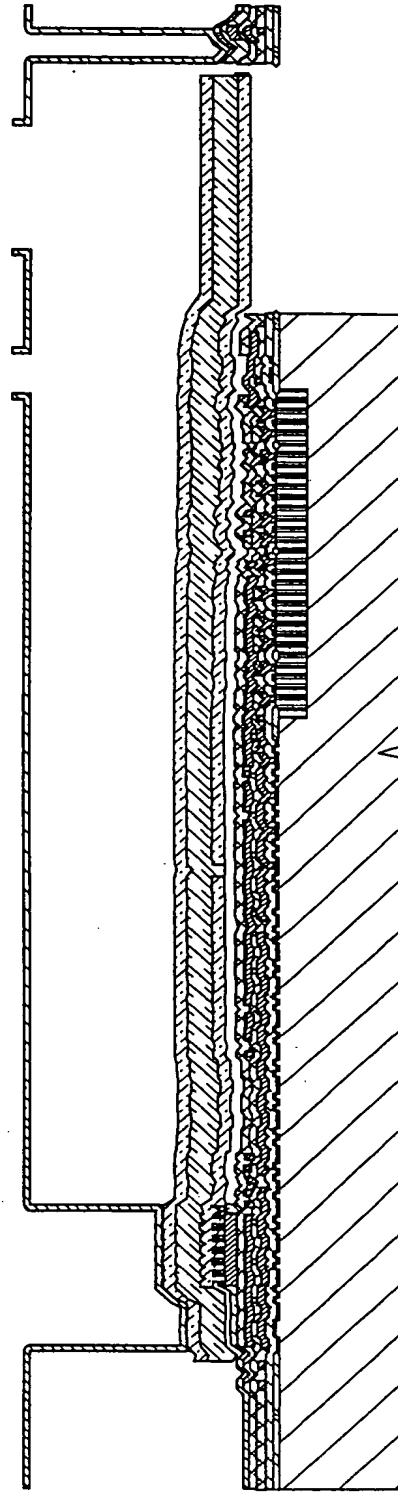


Mount on wafer blank, back-etch inlets

FIG. 69



No mask



Detach from wafer blank, etch sacrificial material

FIG. 71

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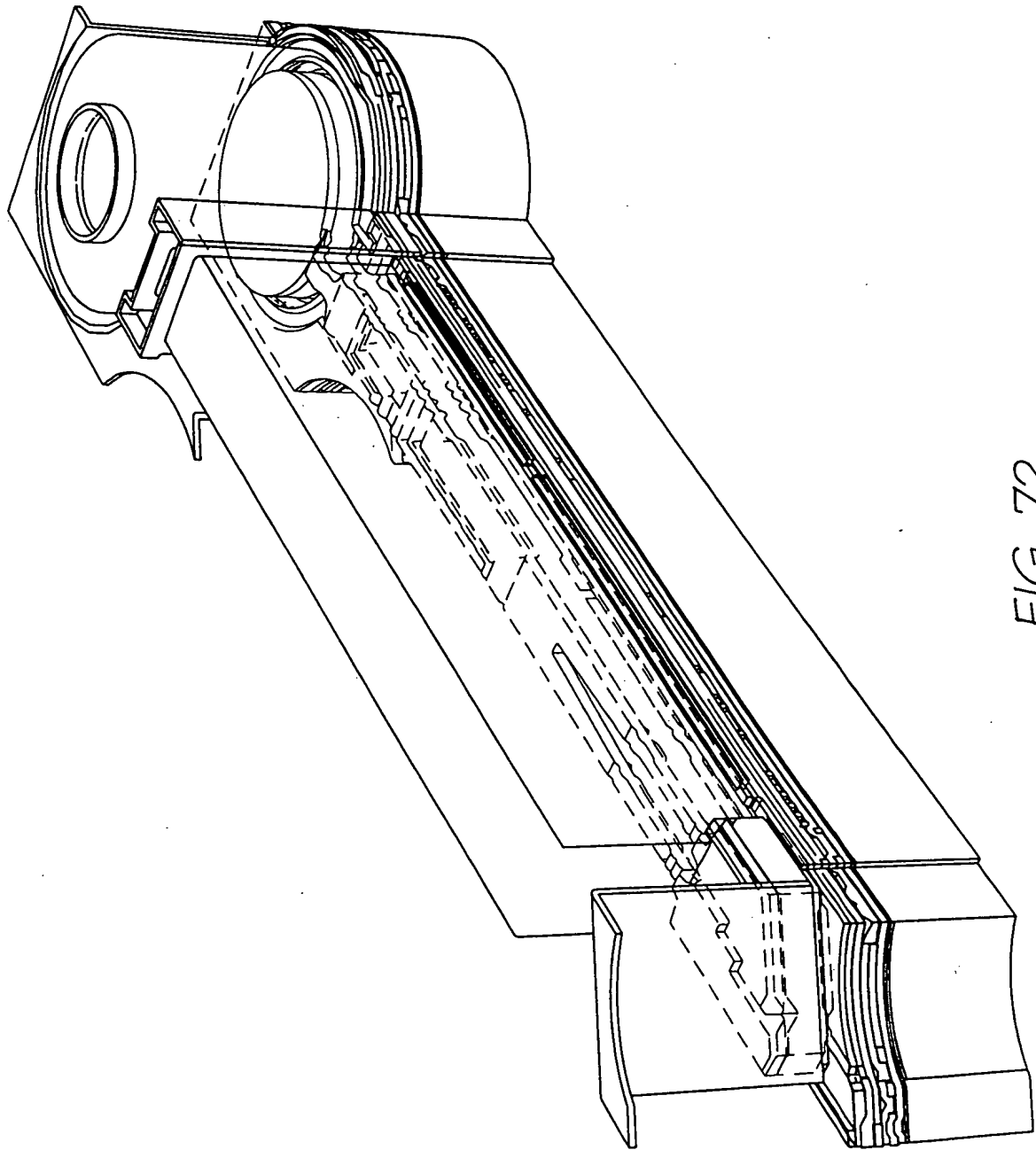


FIG. 72



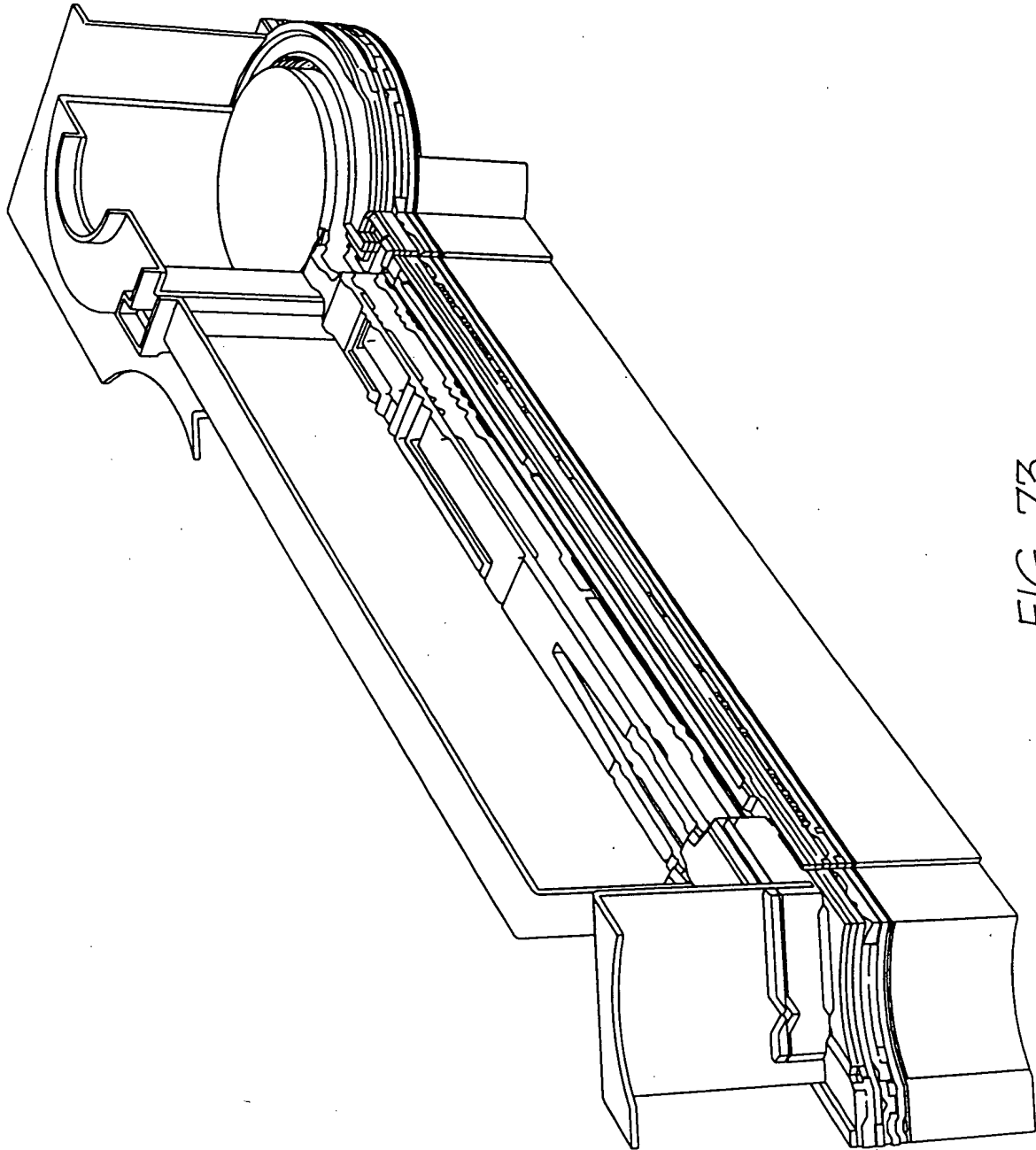
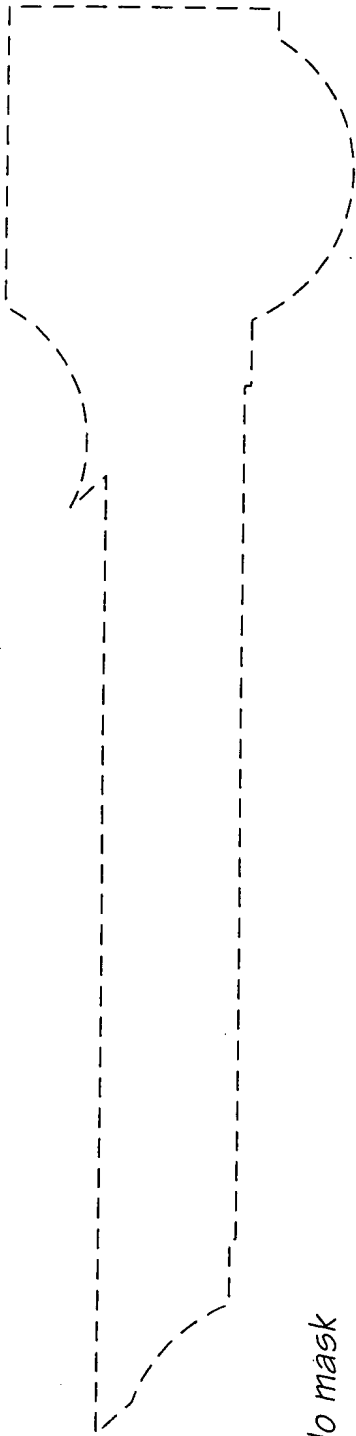
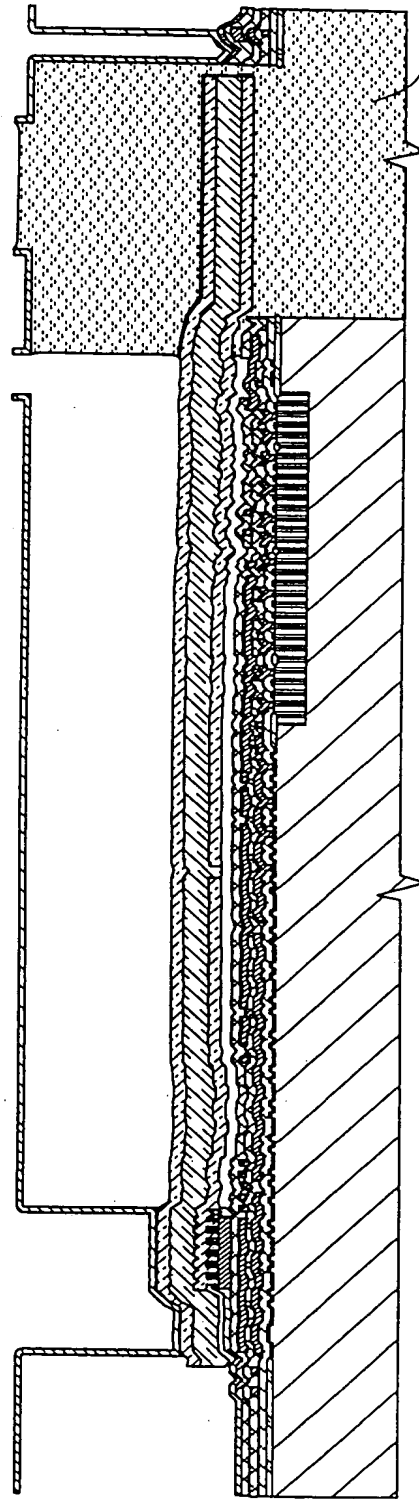


FIG. 73



No mask



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Package, fill with ink, test

FIG. 74

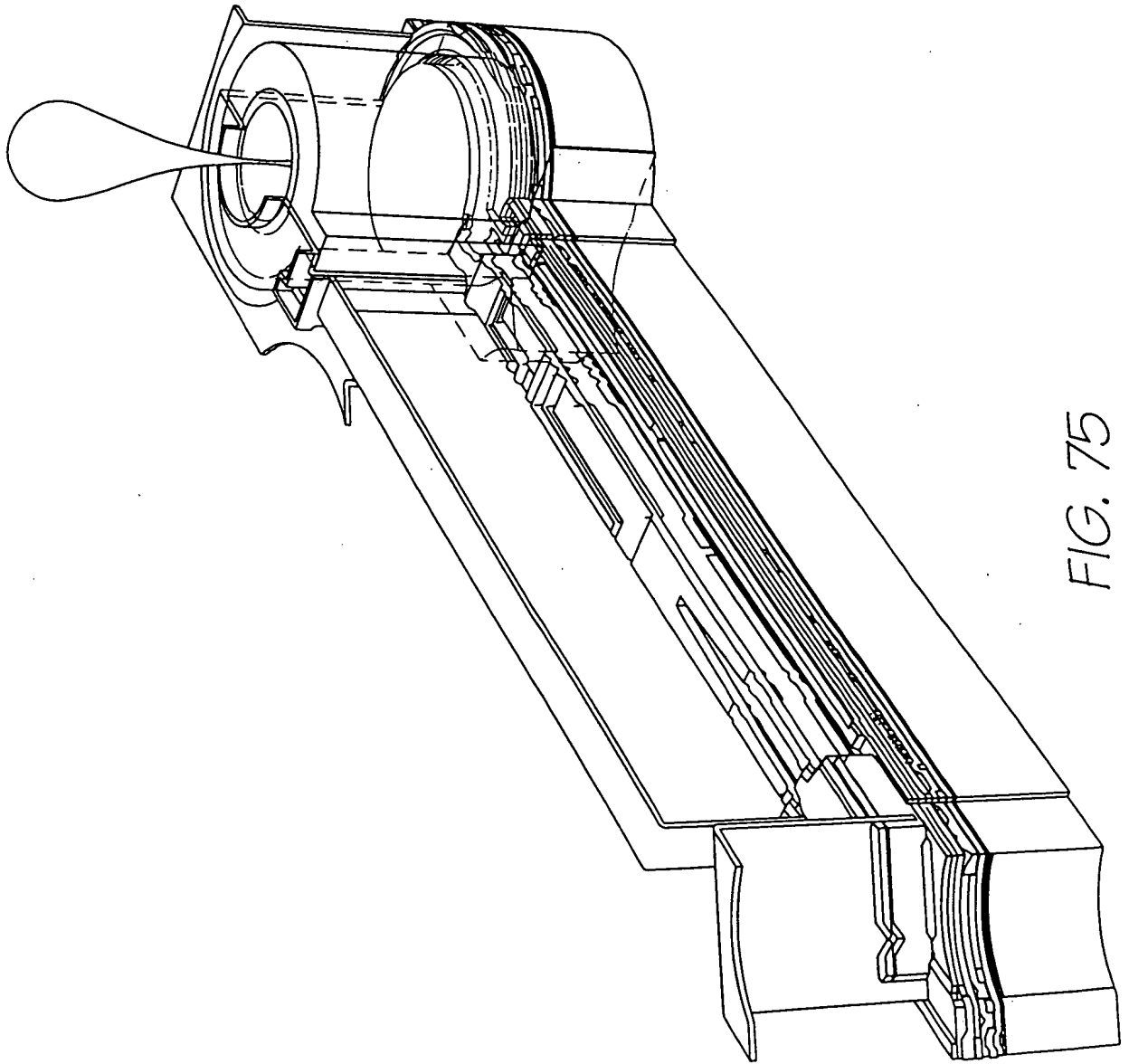


FIG. 75

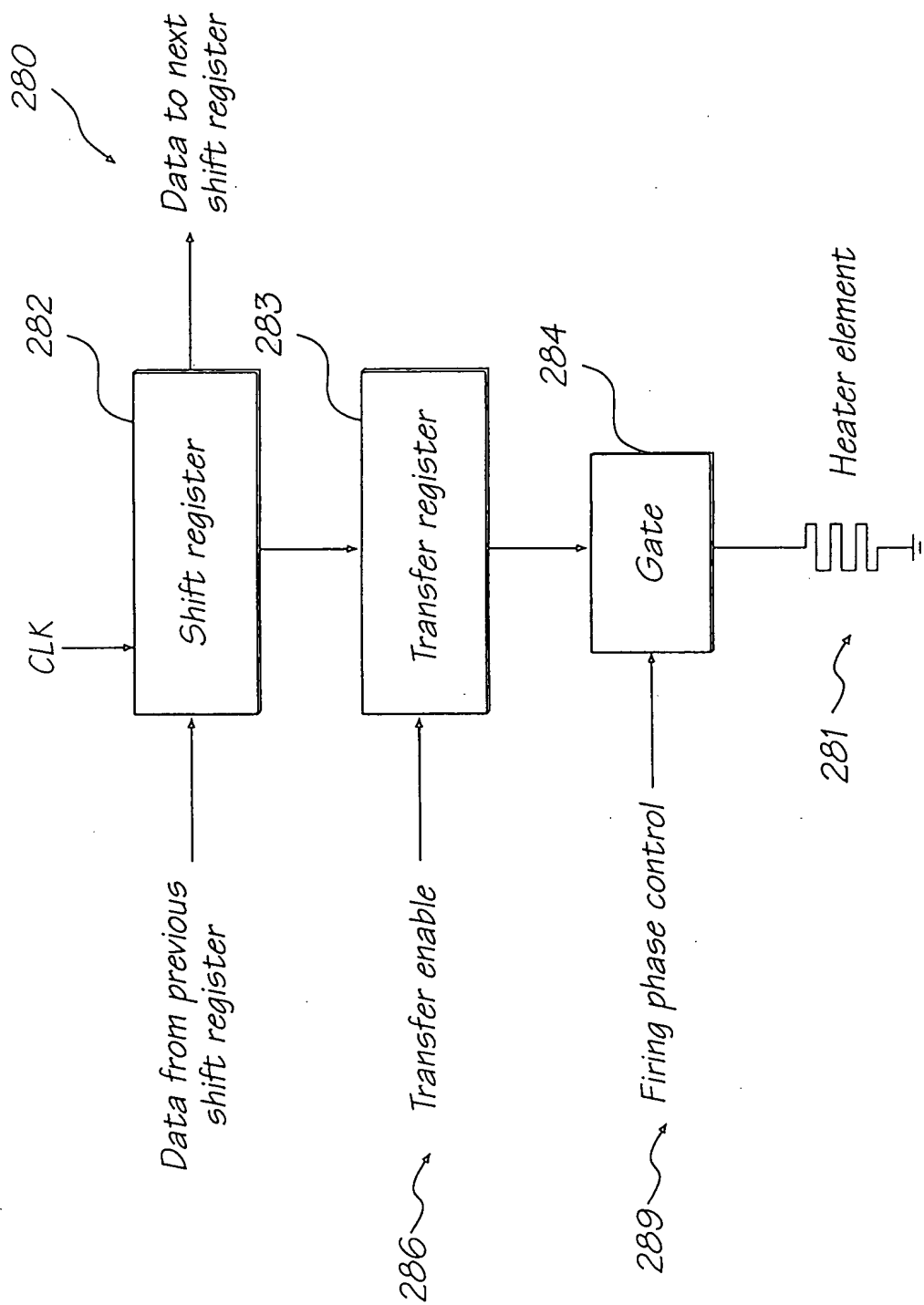


FIG. 76

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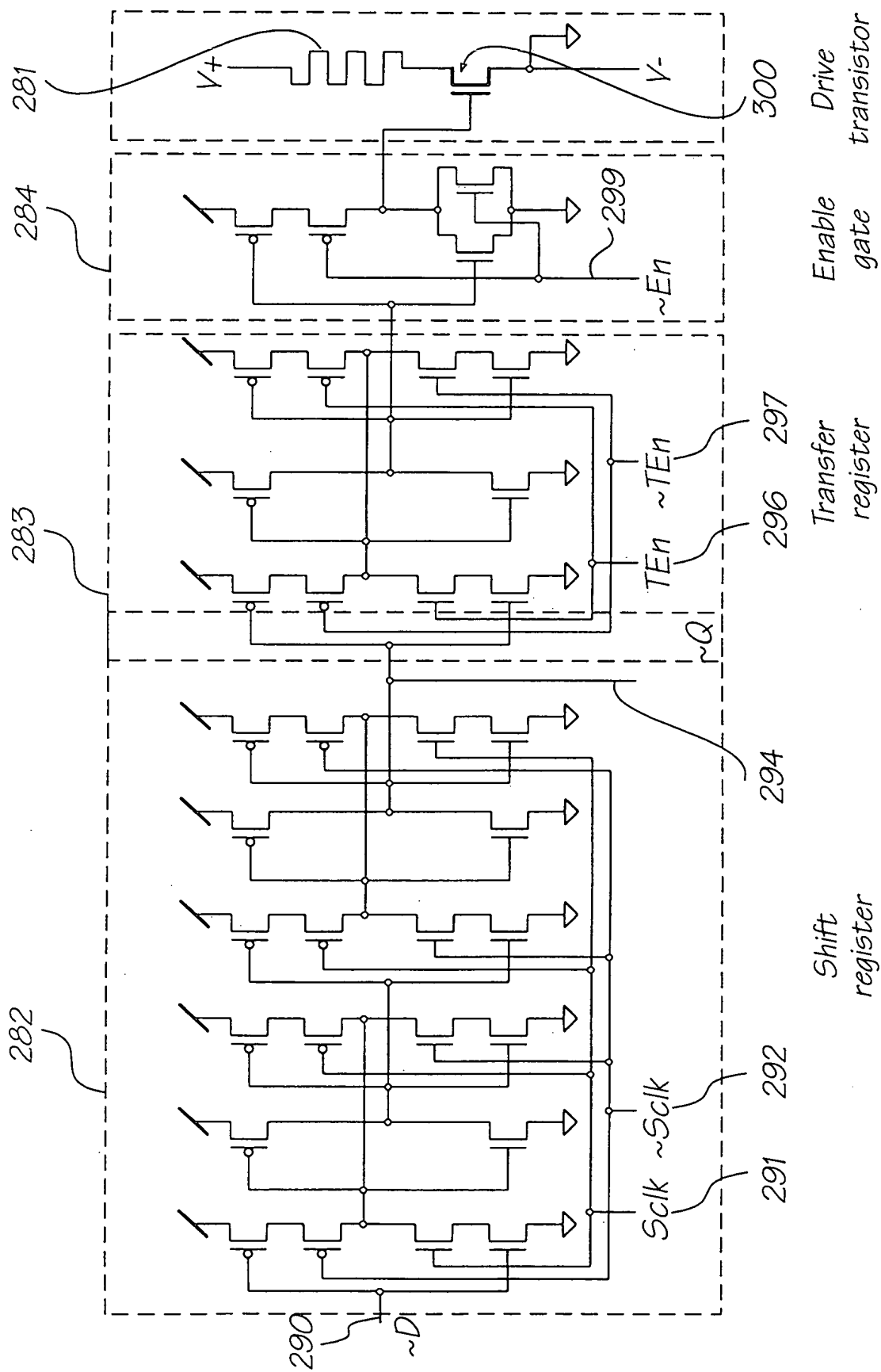


FIG. 77

Key



























|  |         |  |          |   |         |   |                    |   |             |
|--|---------|--|----------|---|---------|---|--------------------|---|-------------|
|   | Silicon |   | Poly     |  | Via 2   |   | Actuator TiN       |    | Cyan Ink    |
|   |         |   | Contacts |  | Metal 3 |   | Actuator Glass     |    | Magenta Ink |
|   | Active  |   | Metal 1  |  | Via 3   |   | Compensator TiN    |    | Yellow Ink  |
|   | p+      |   | Via 1    |   |         |   | Sacrificial        |   |             |
|  | n+      |  | Metal 2  |   |         |  | Sacrificial-nozzle |   |             |
|  |         |  |          |   |         |   |                    |  | Floor       |
|  |         |  |          |   |         |   |                    |  | Wall        |
|  |         |  |          |   |         |   |                    |  | Roof        |
|  |         |  |          |   |         |   |                    |  | Rim         |
|  |         |  |          |   |         |   |                    |  | Shroud      |

FIG. 78

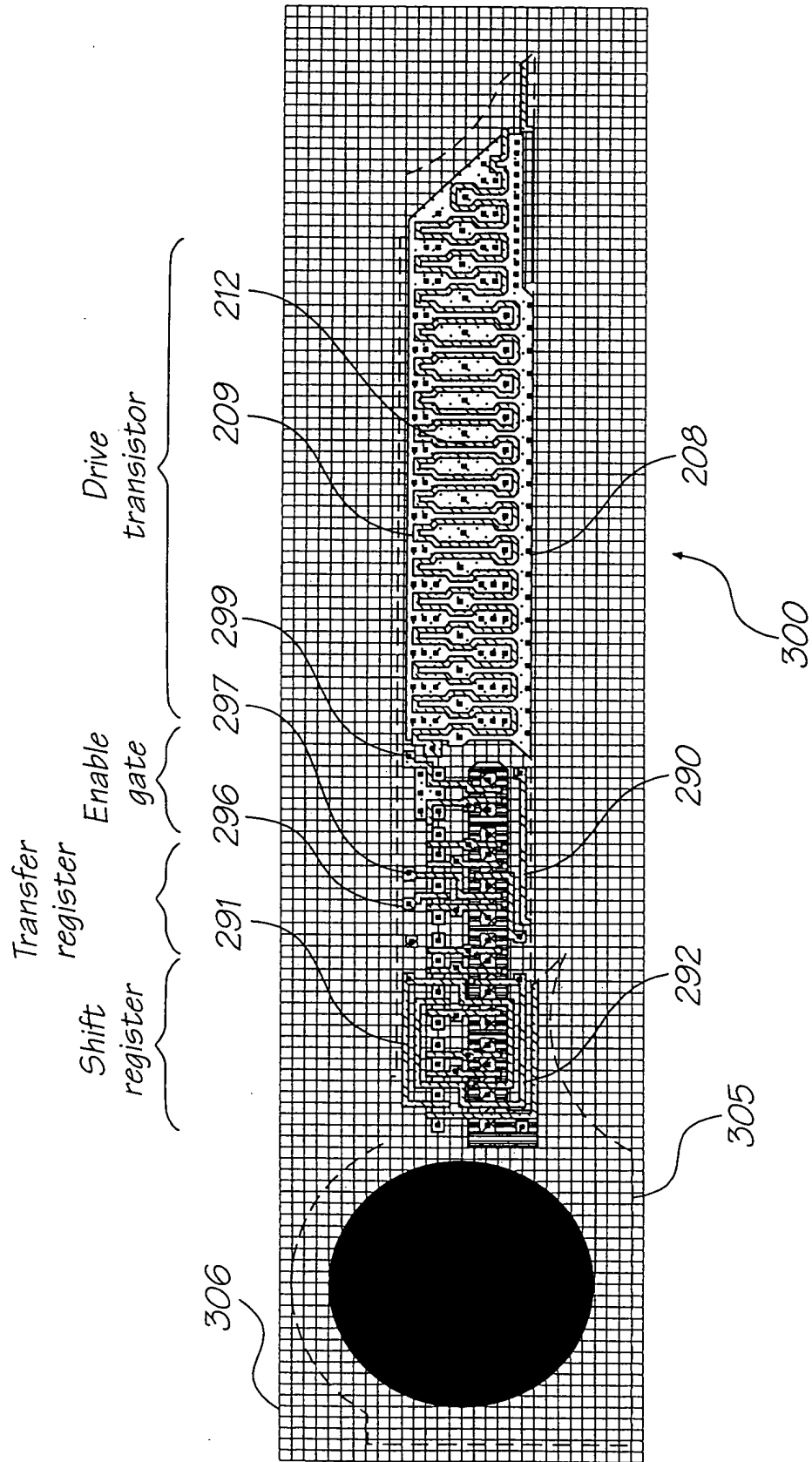


FIG. 79

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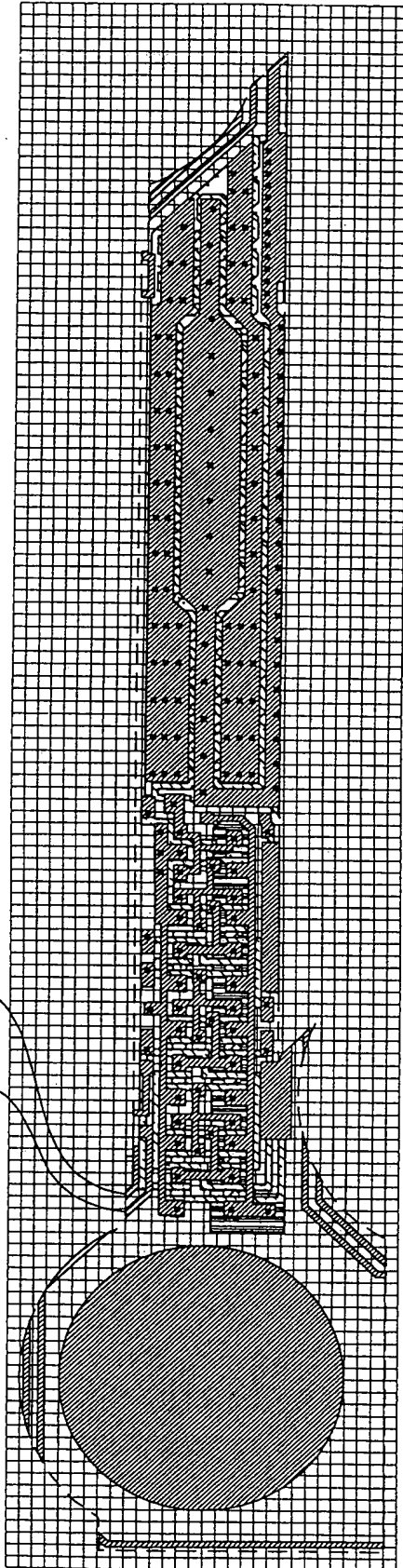


FIG. 80



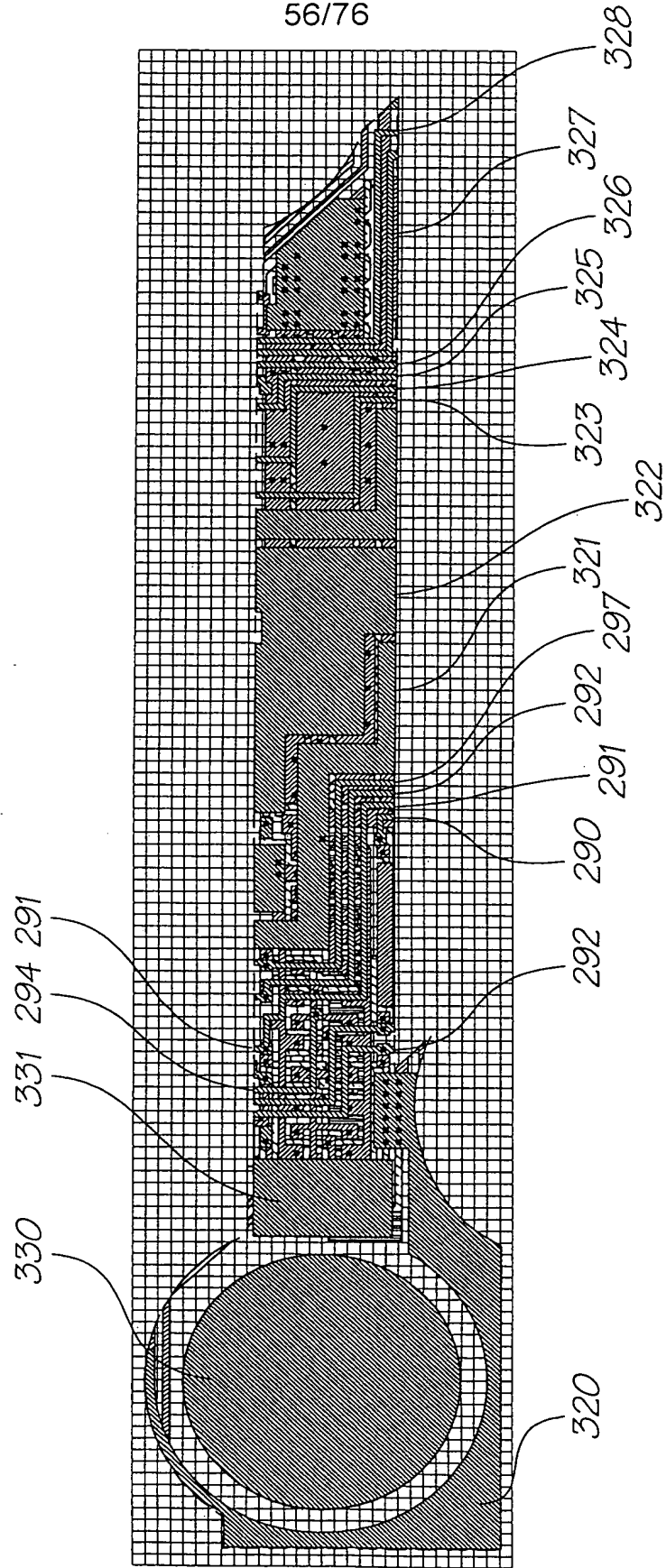


FIG. 81

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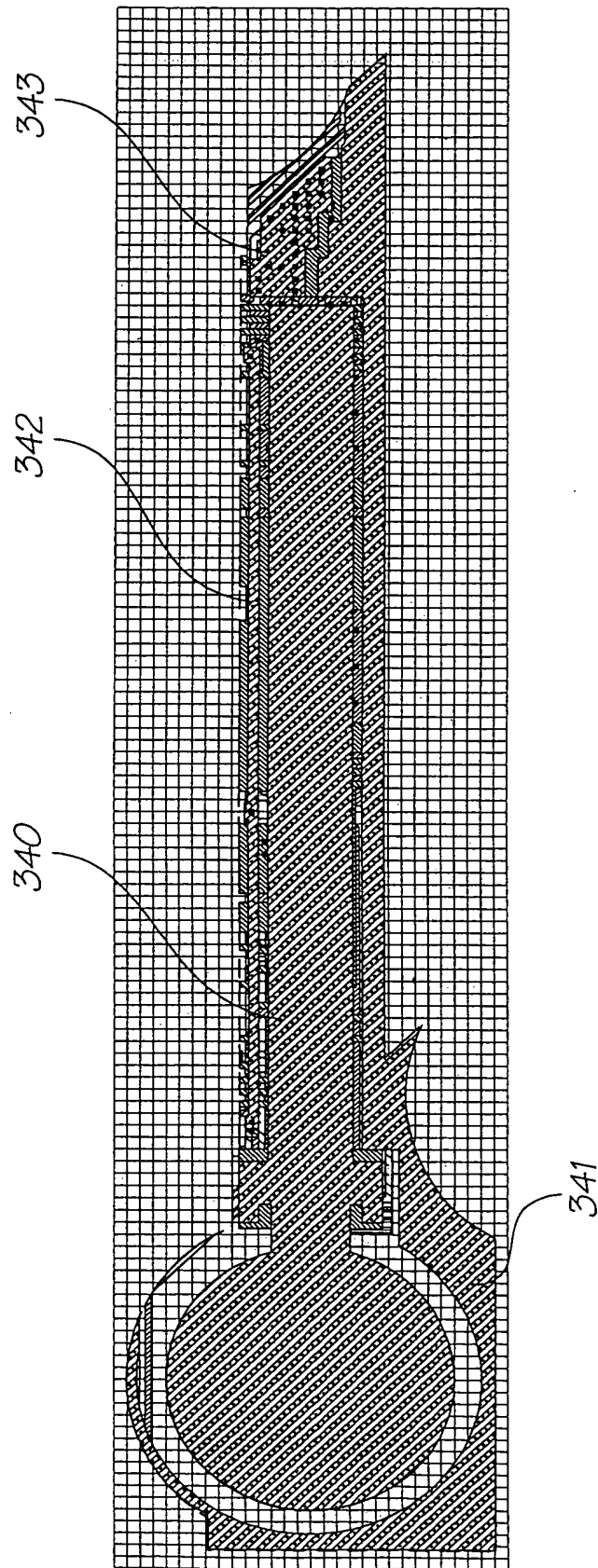


FIG. 82

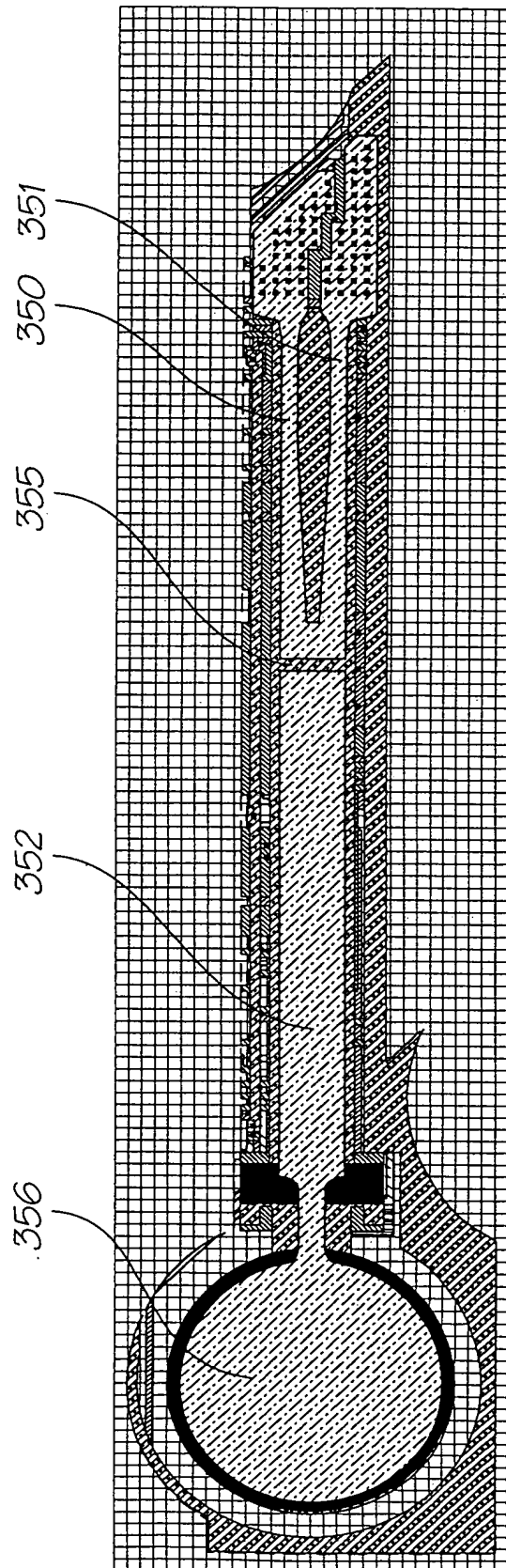


FIG. 83

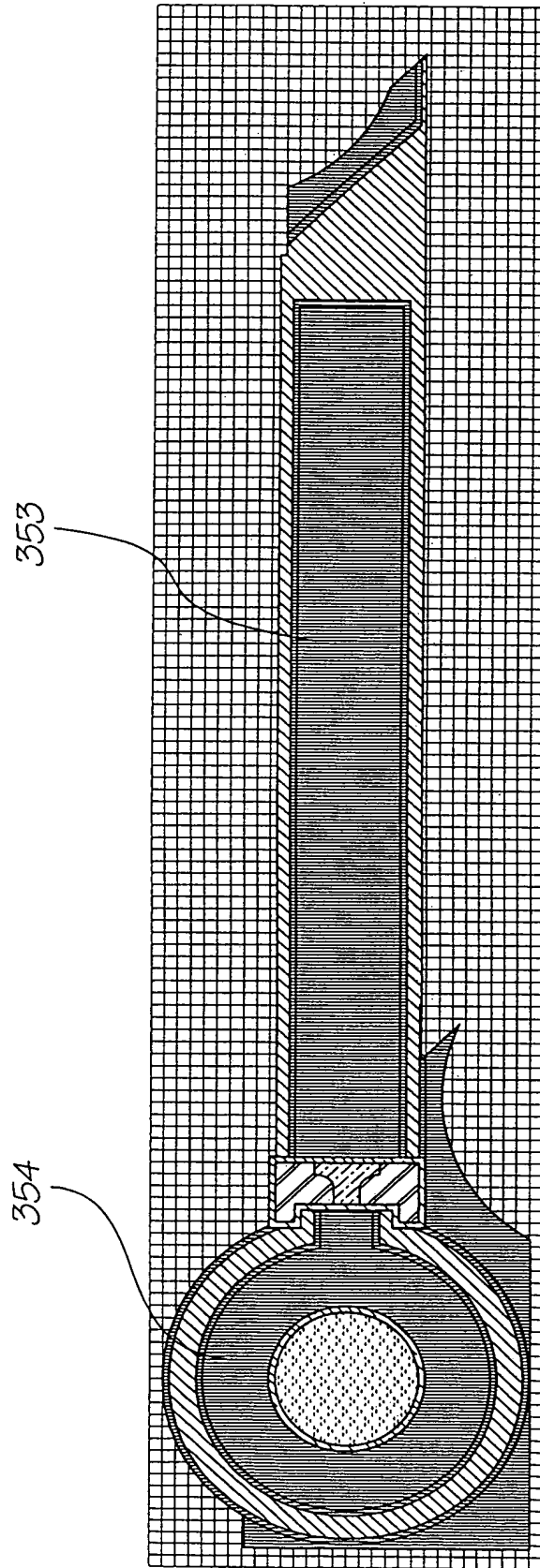


FIG. 84

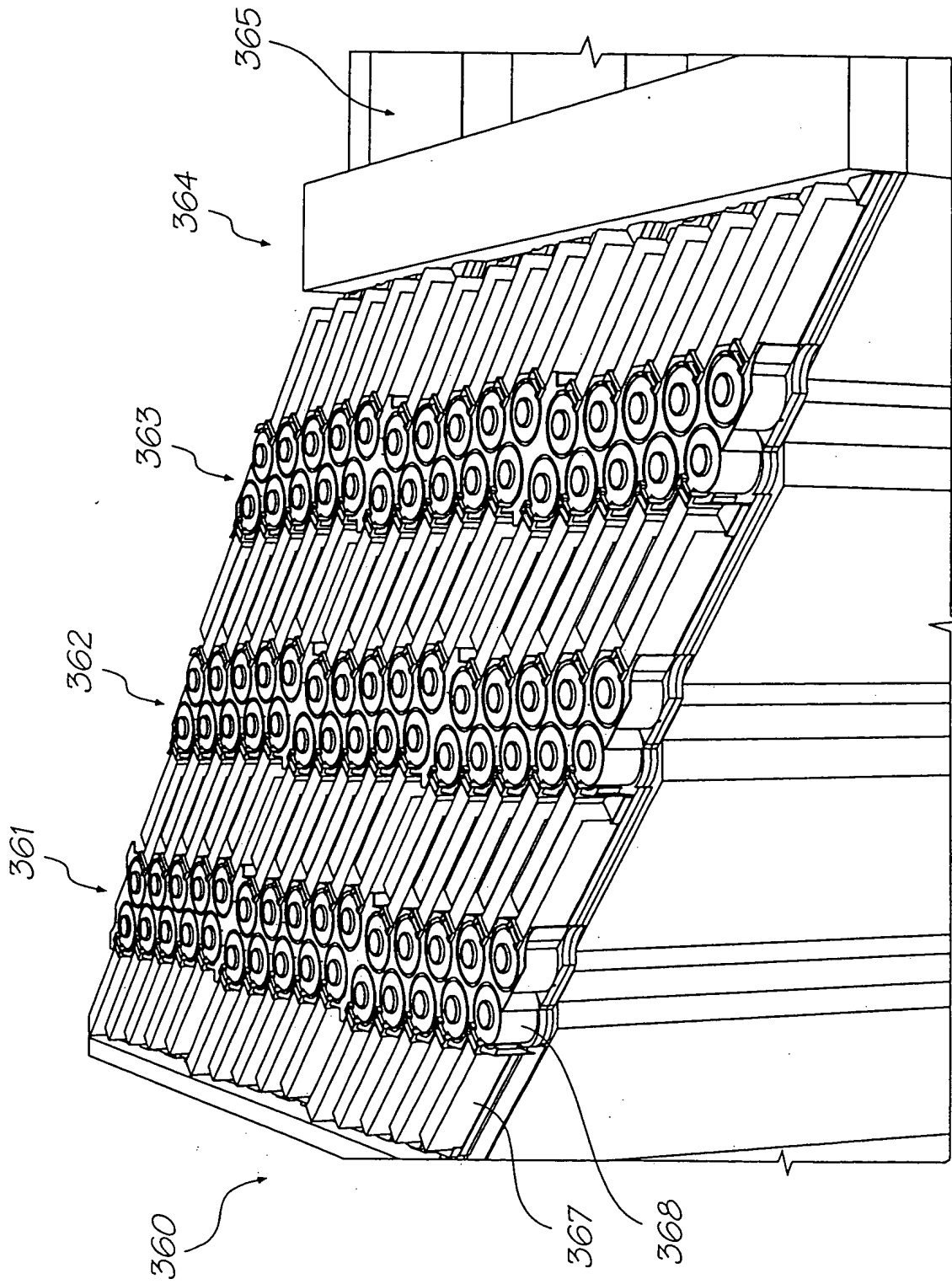
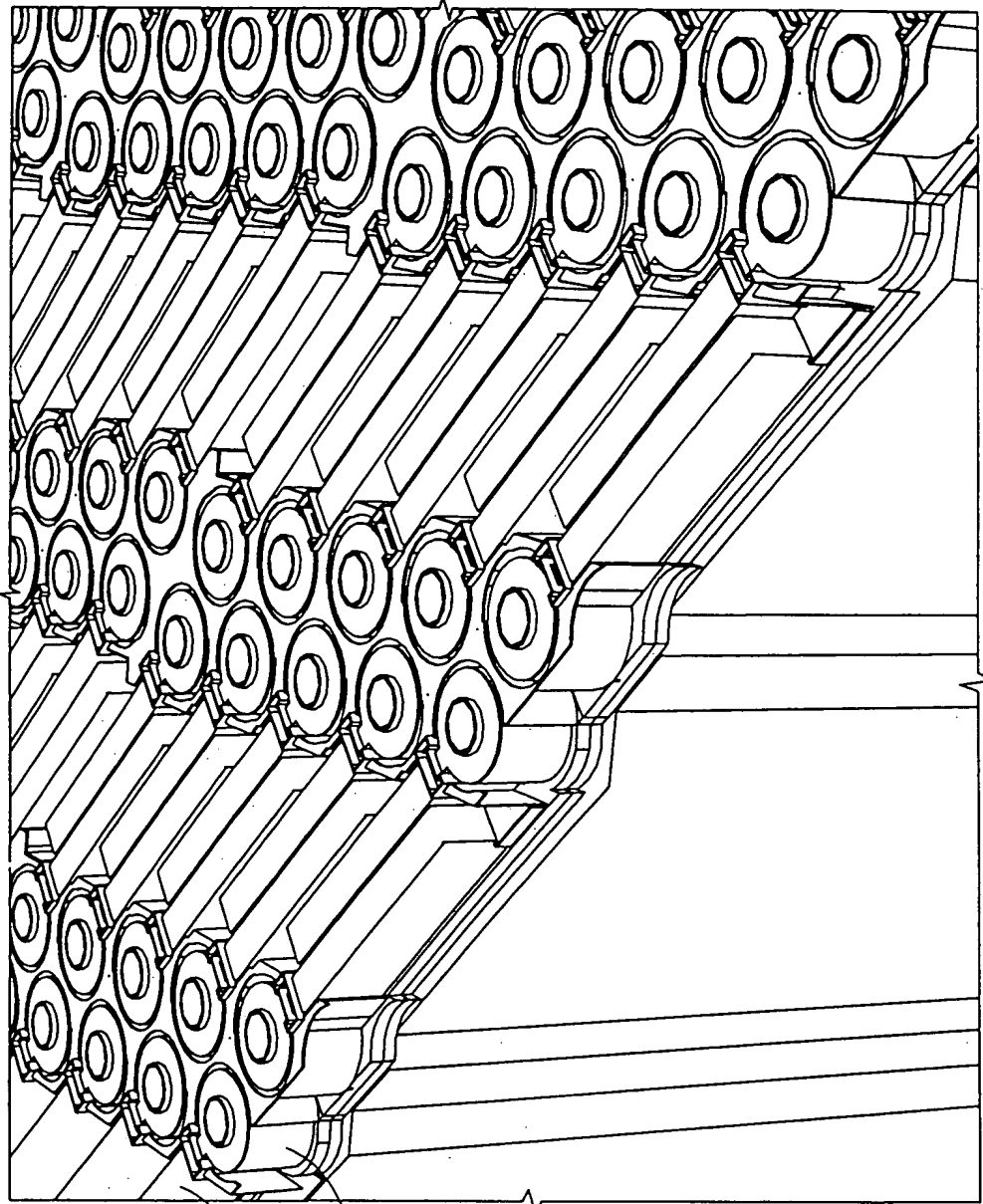


FIG. 85



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FIG. 86

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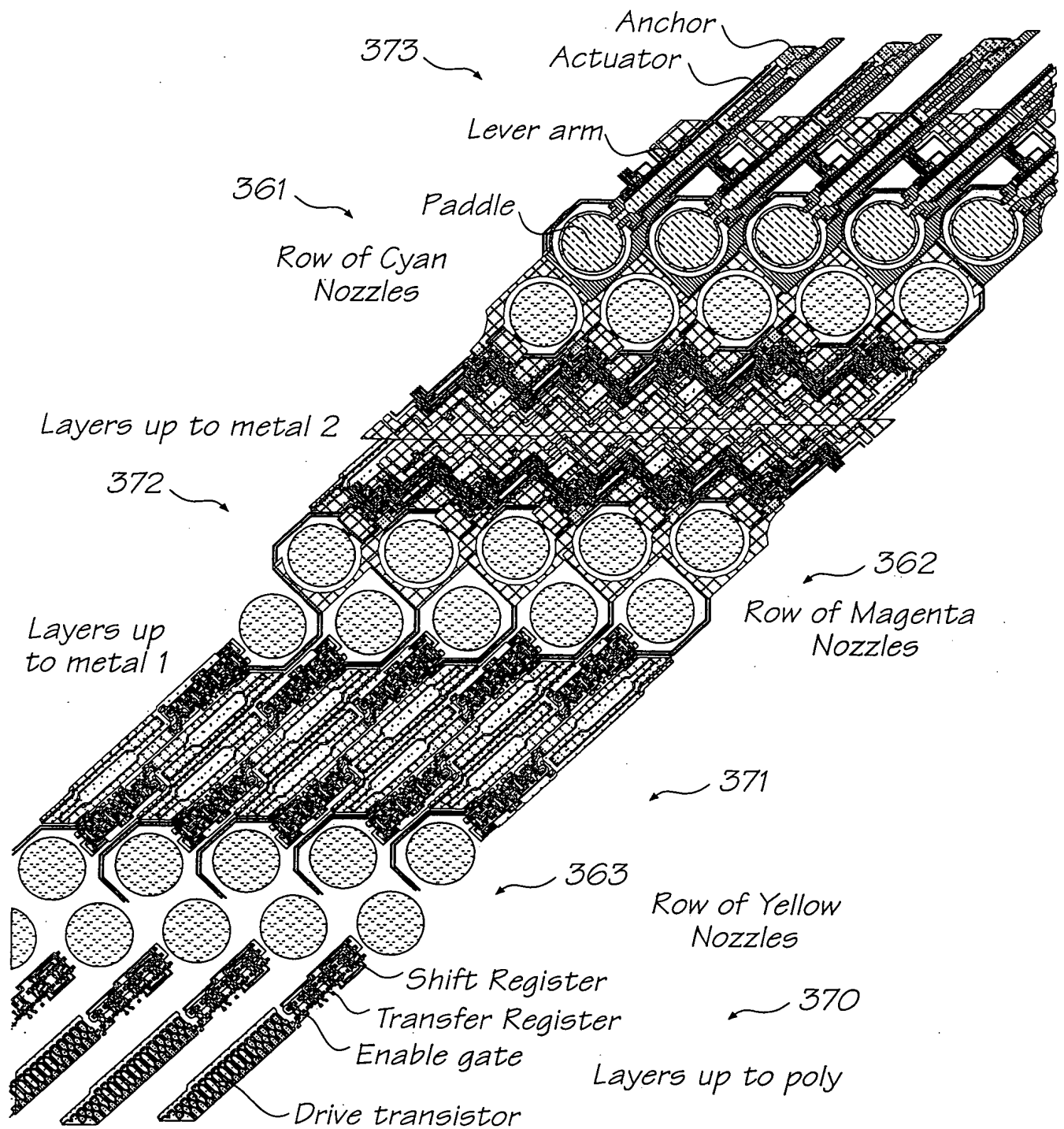


FIG. 87

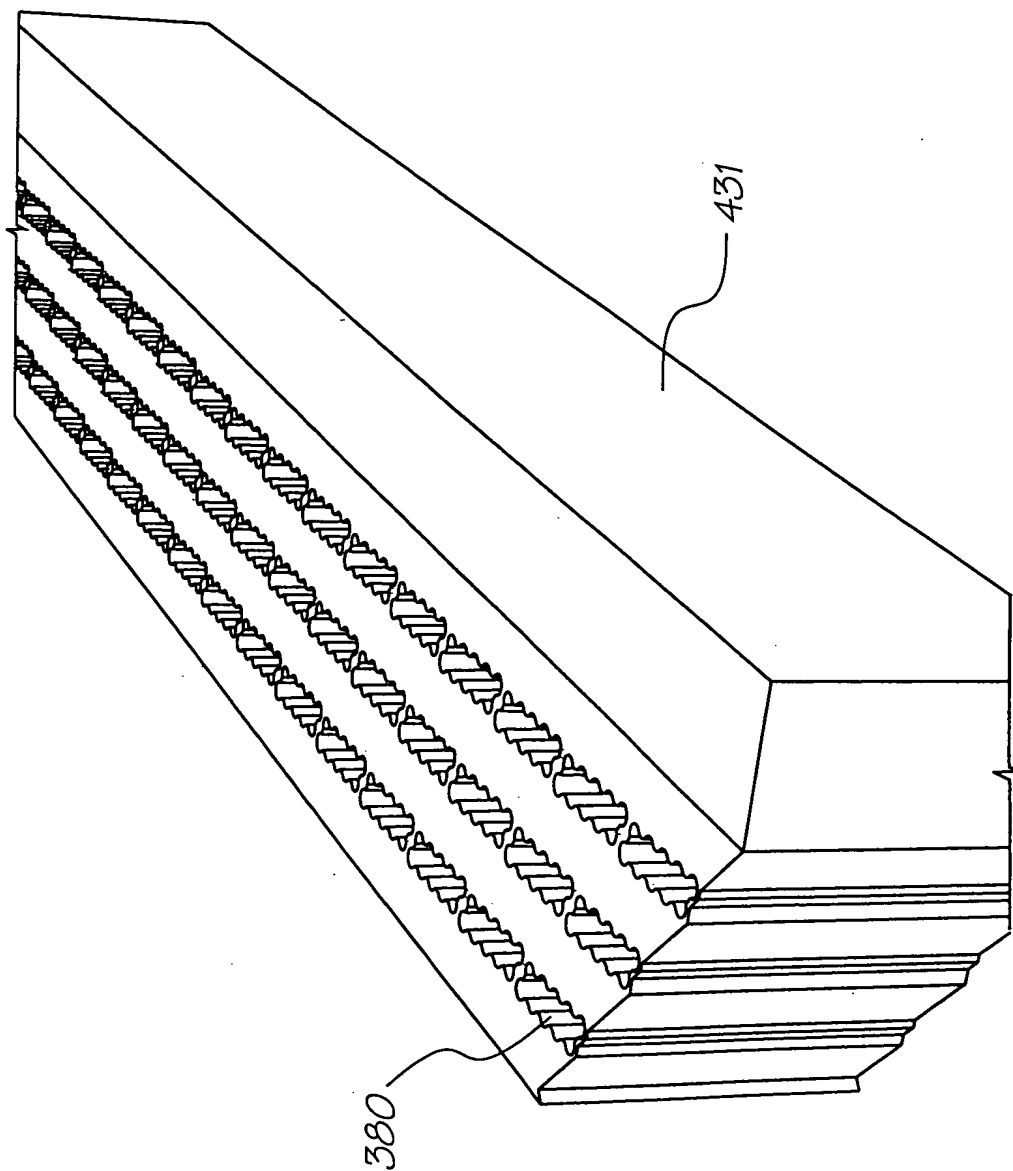


FIG. 88



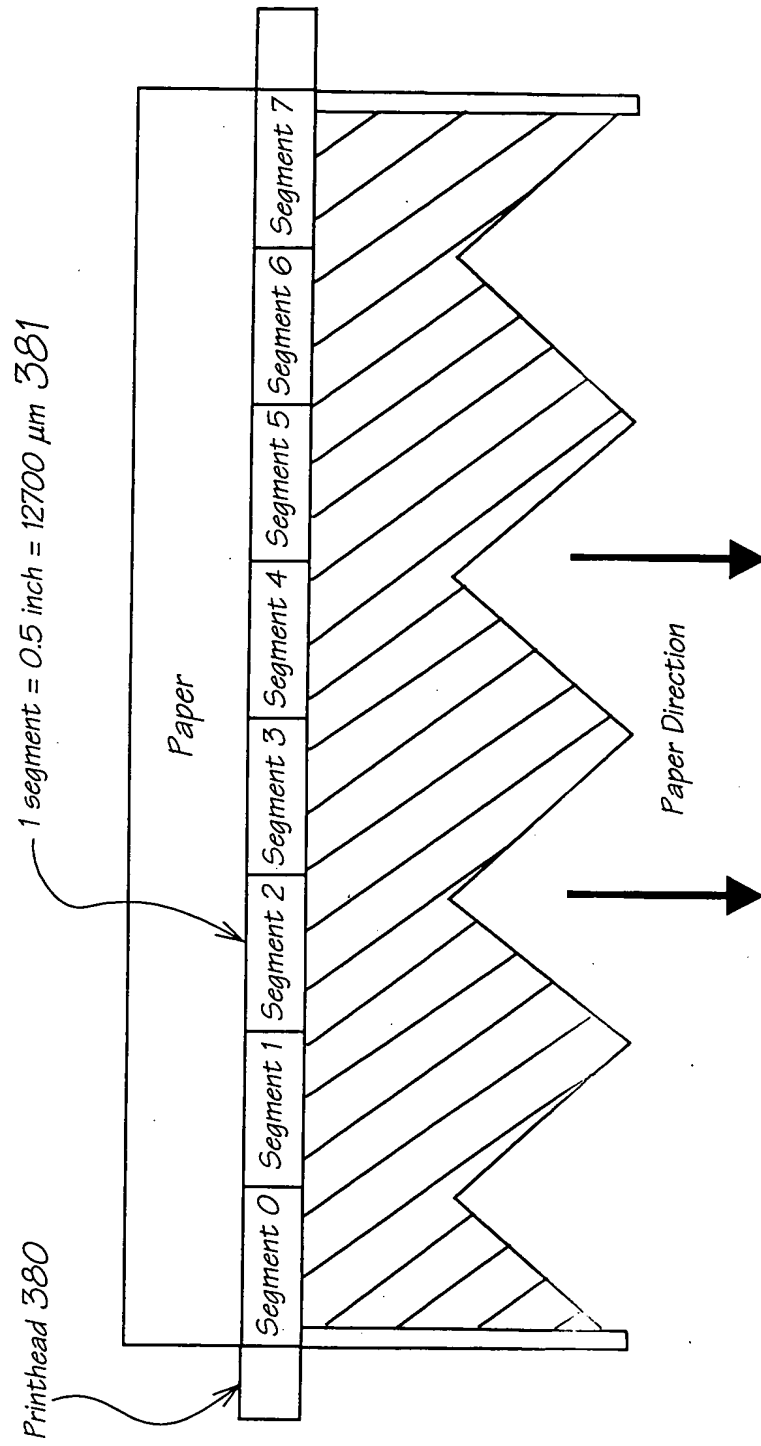
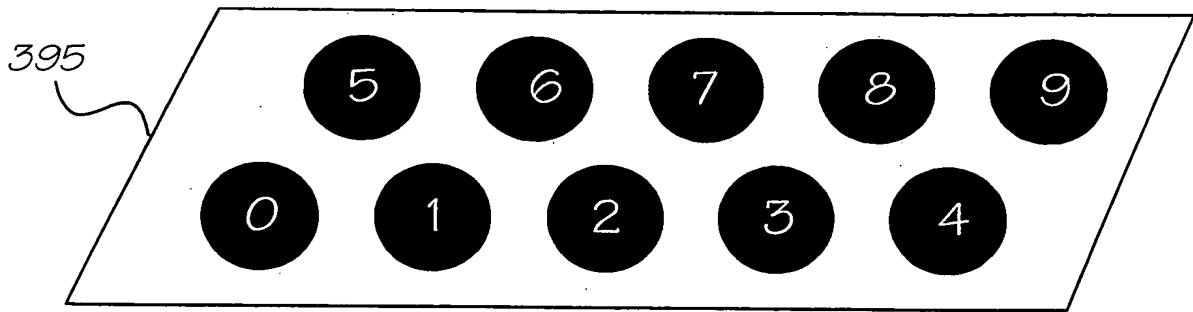


FIG. 89



A single pod, numbered by firing order

Fig. 90

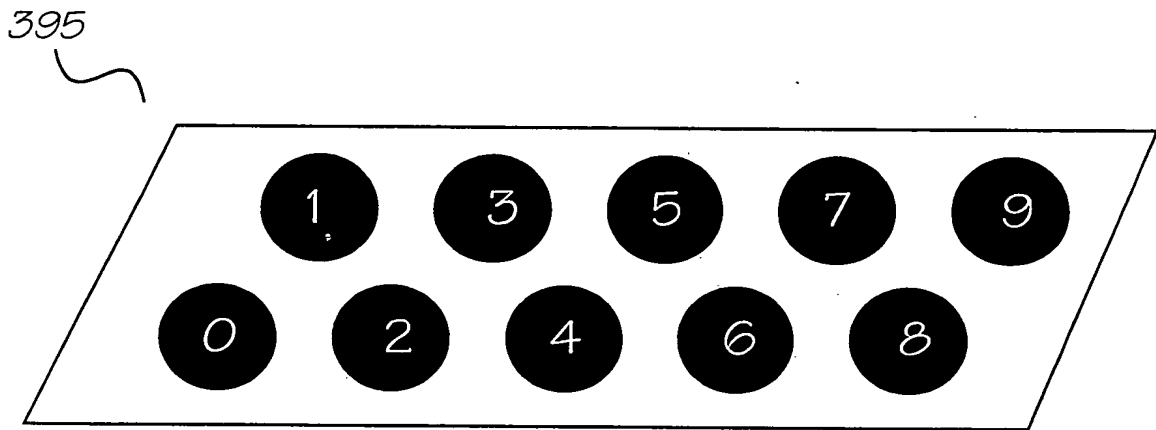


Fig. 91

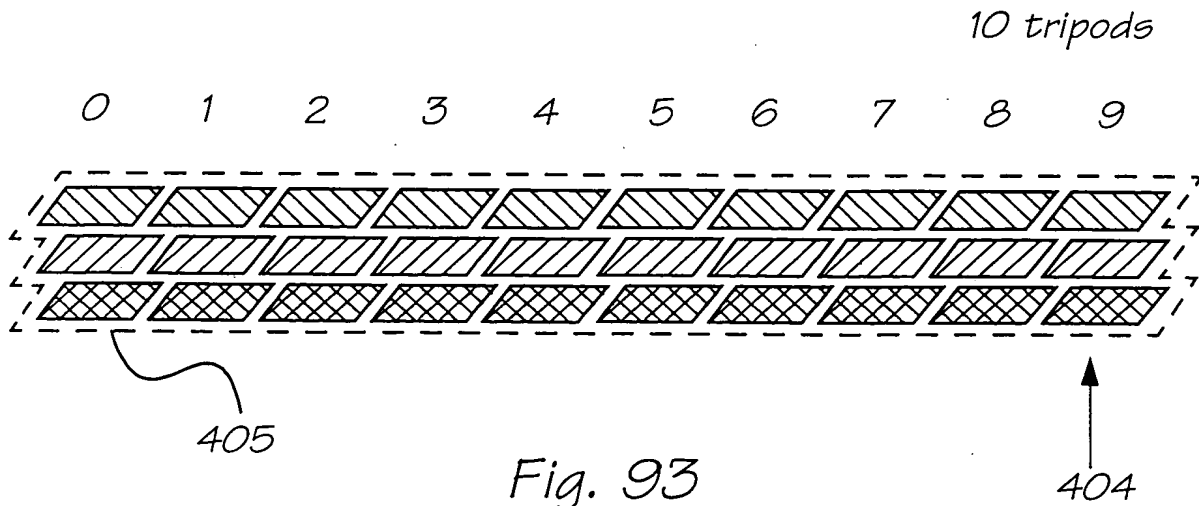


Fig. 93

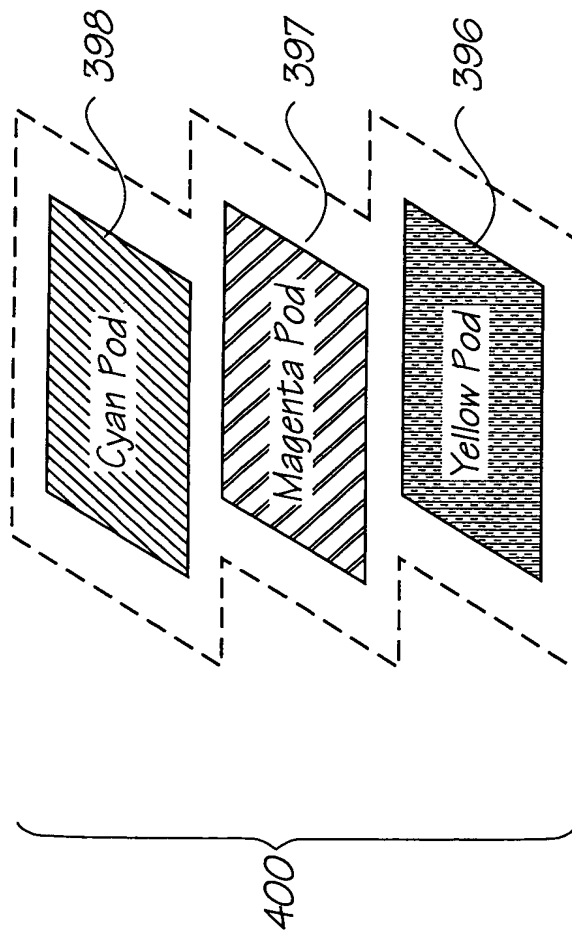


FIG. 92

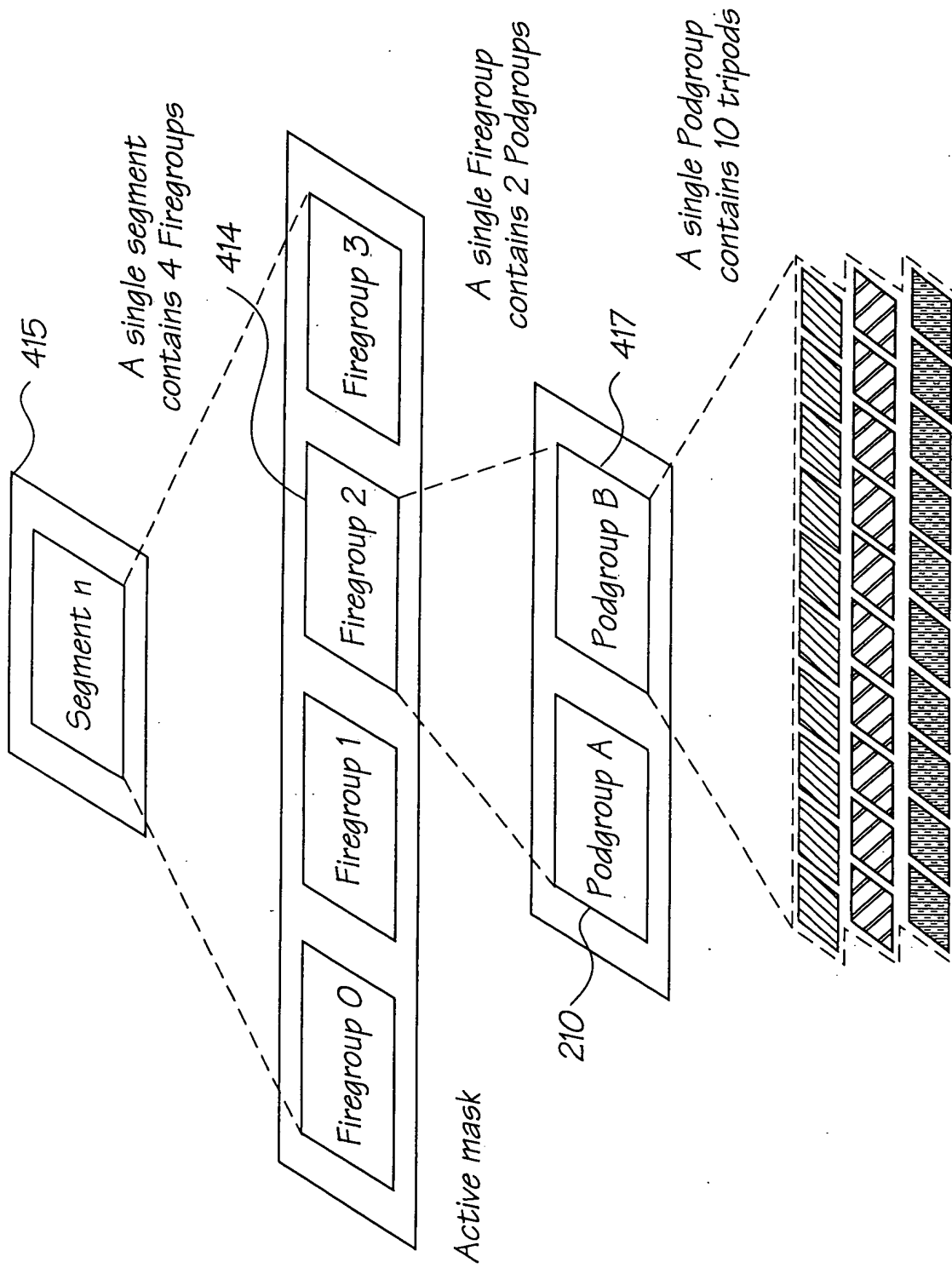


FIG. 94

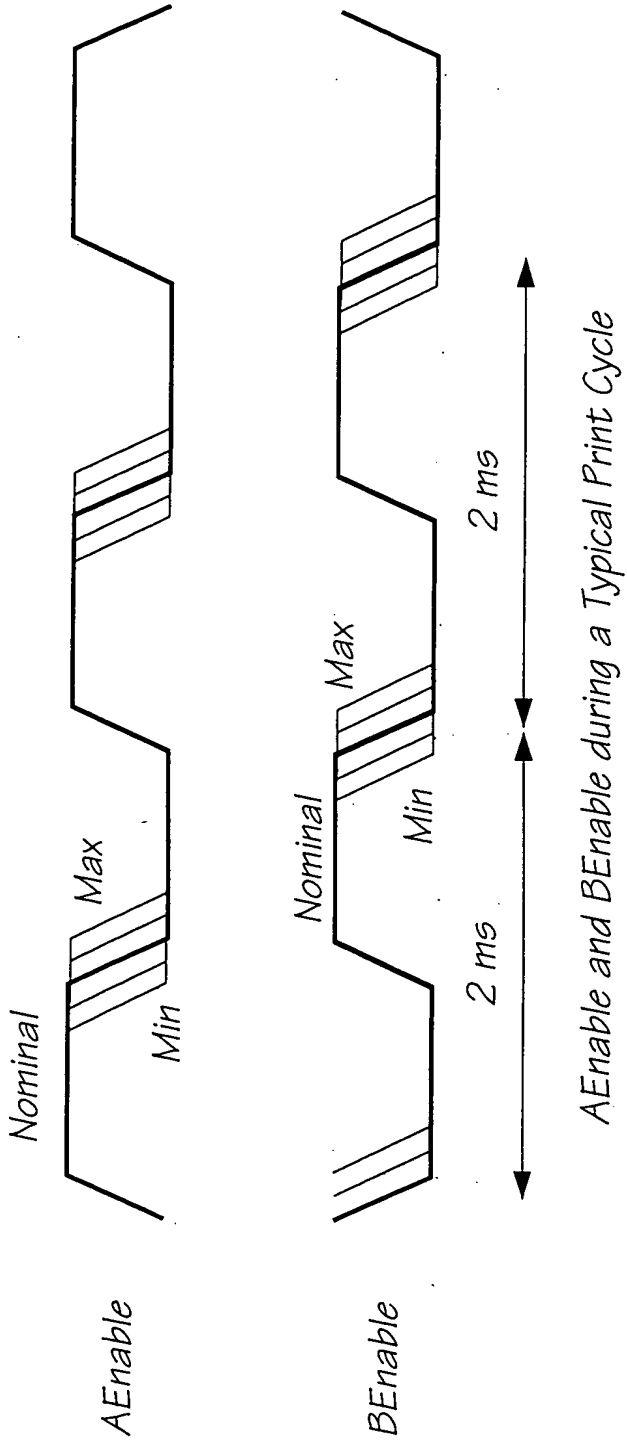


Fig. 95

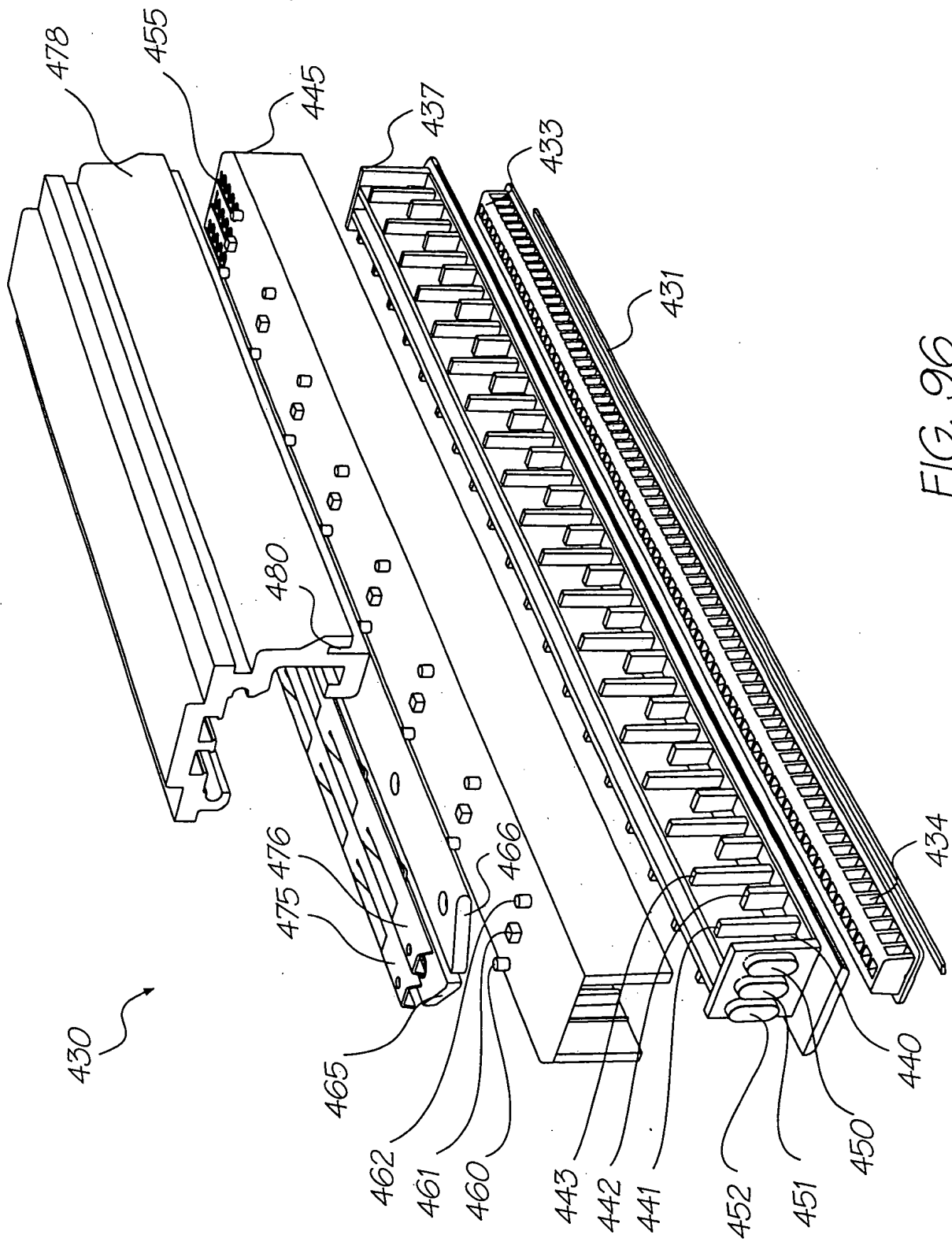


FIG. 96

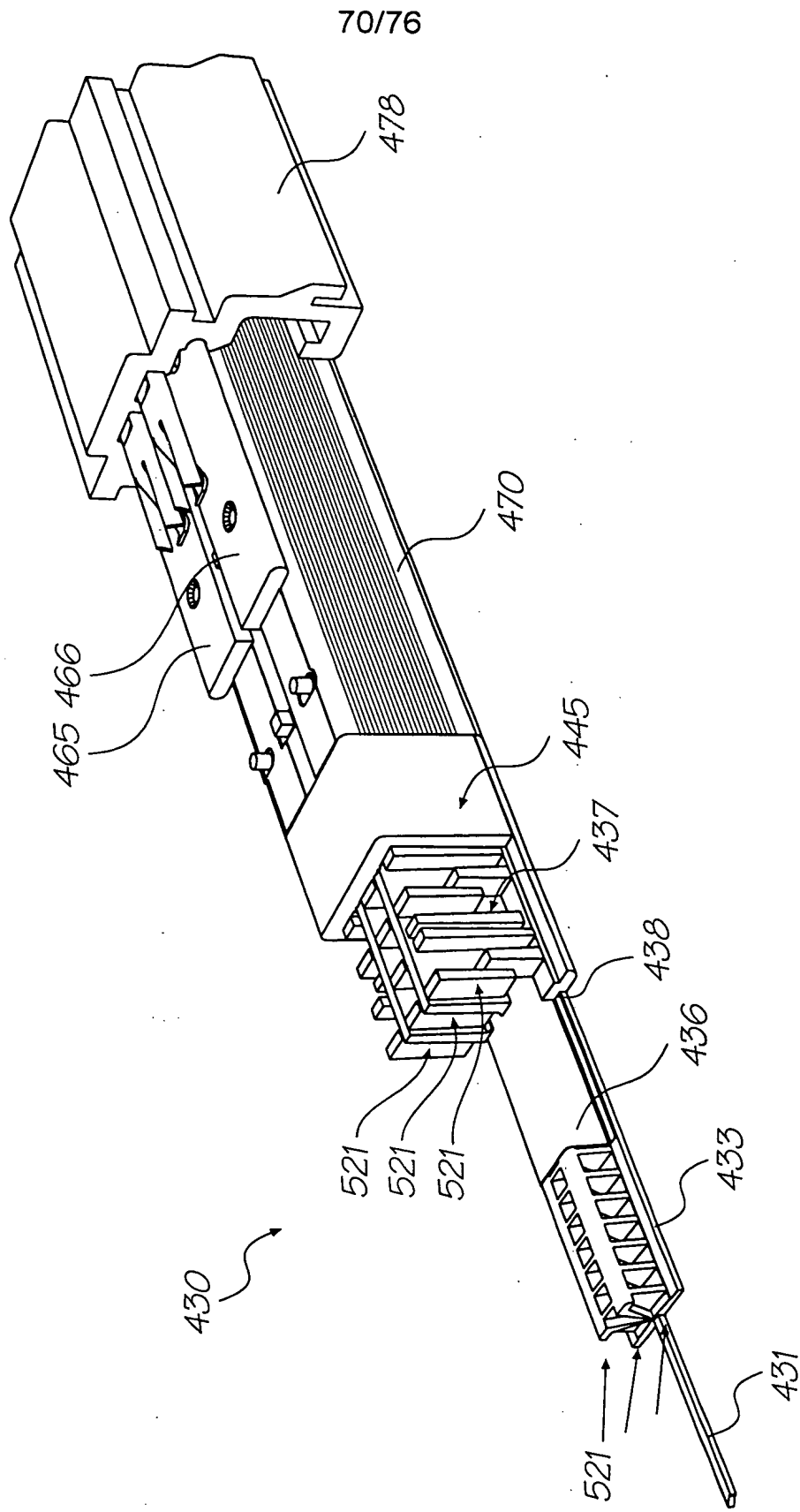


FIG. 97

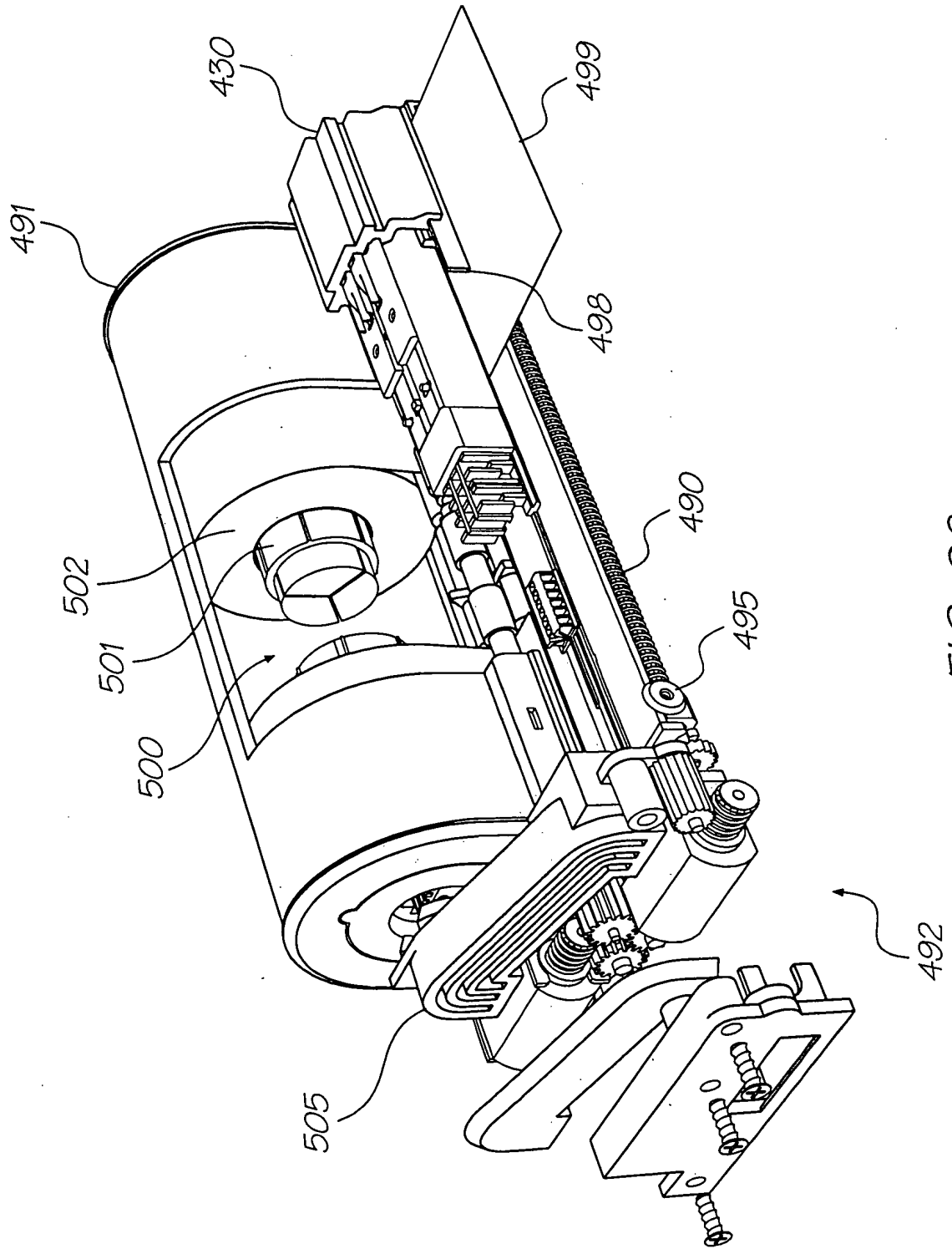


FIG. 98



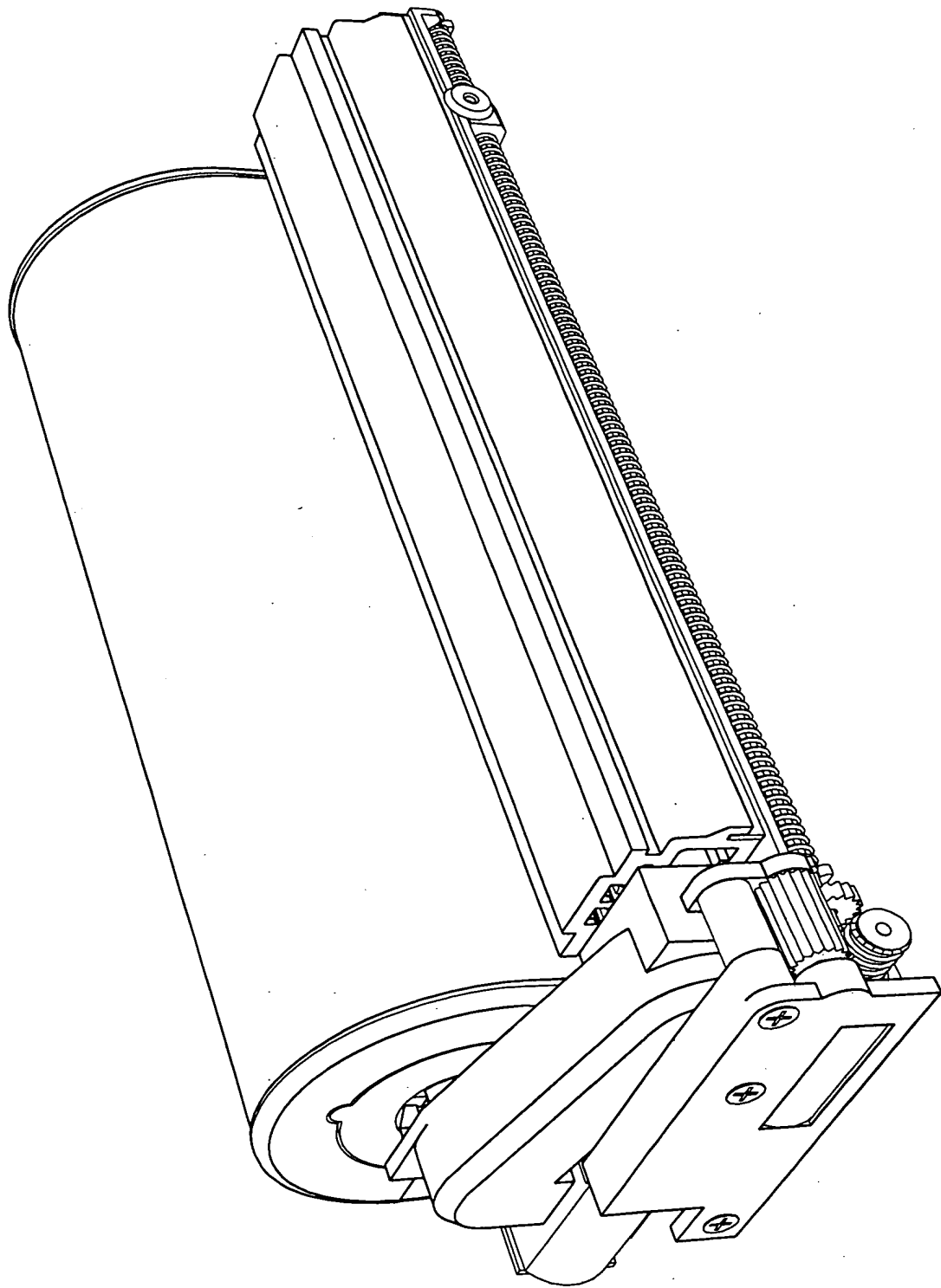


FIG. 99

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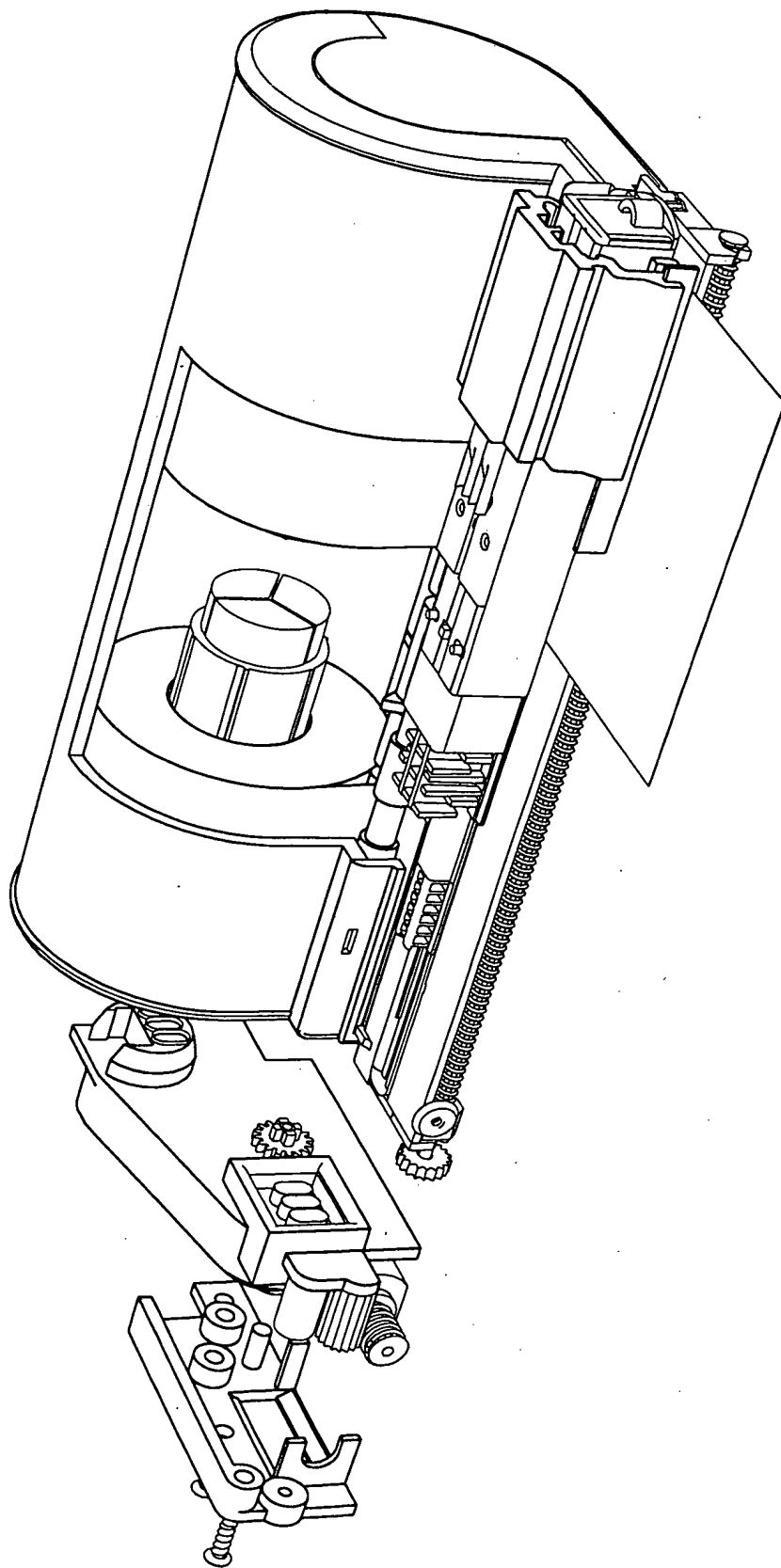


FIG. 100

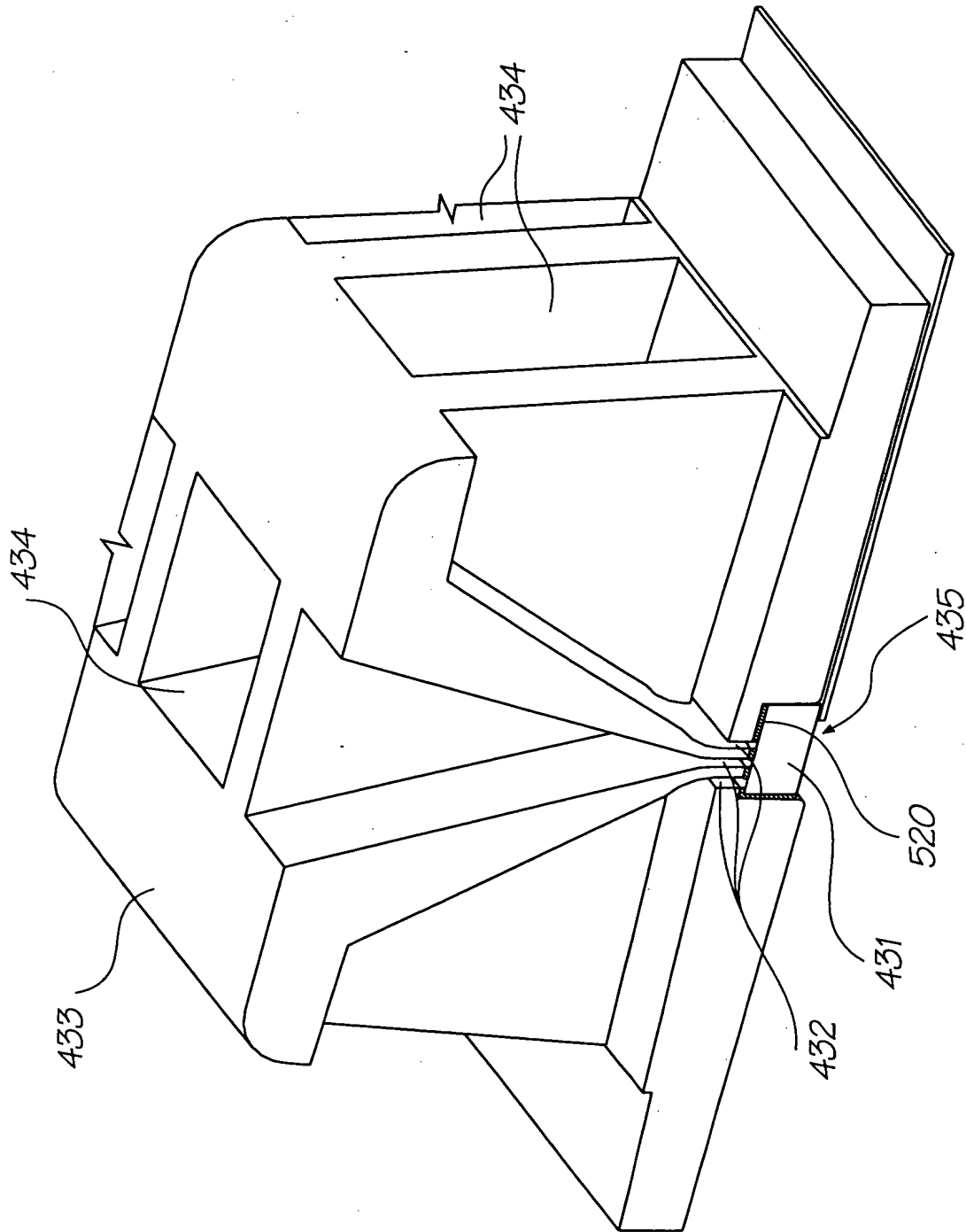


FIG. 101

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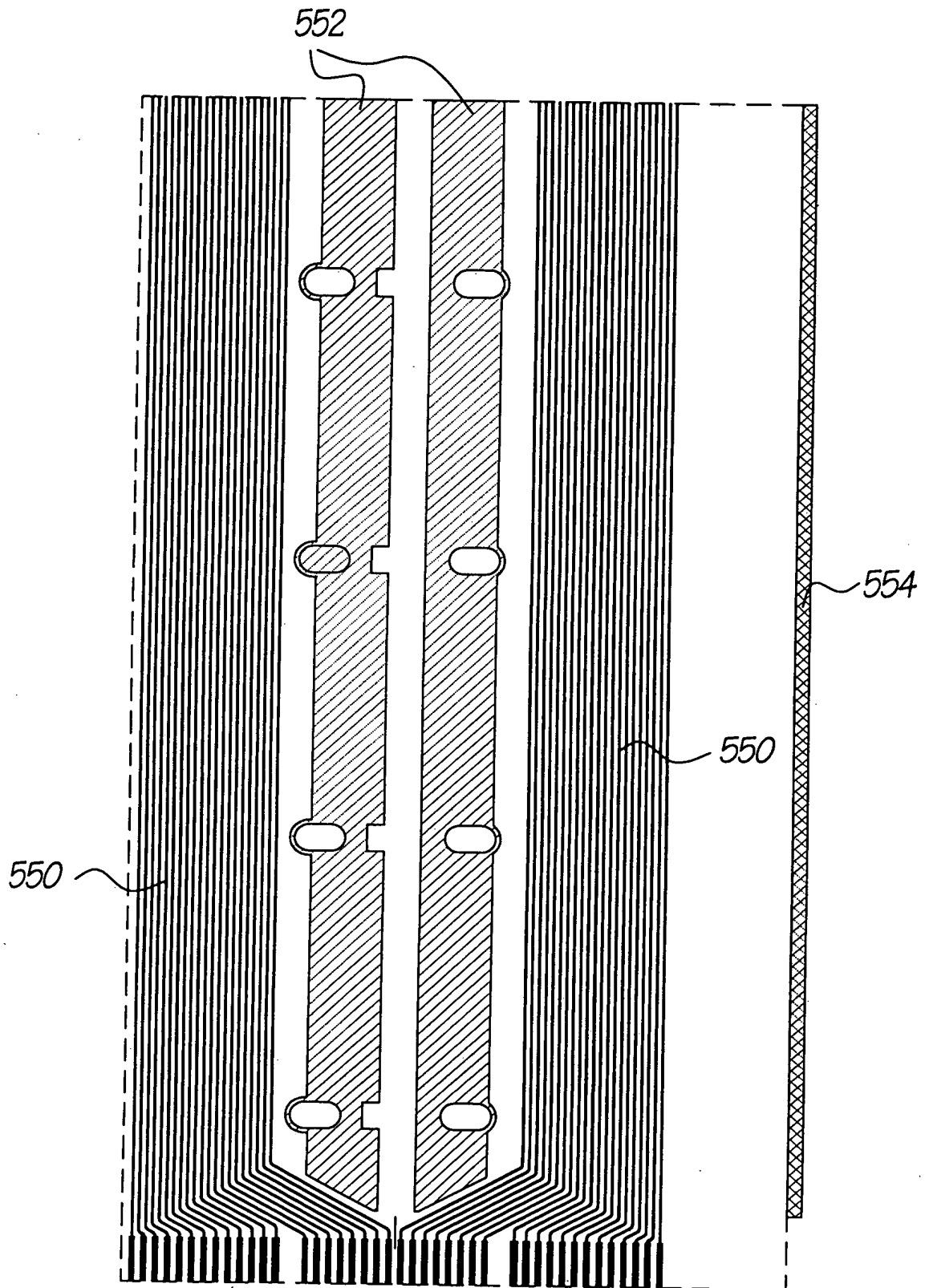


FIG. 102

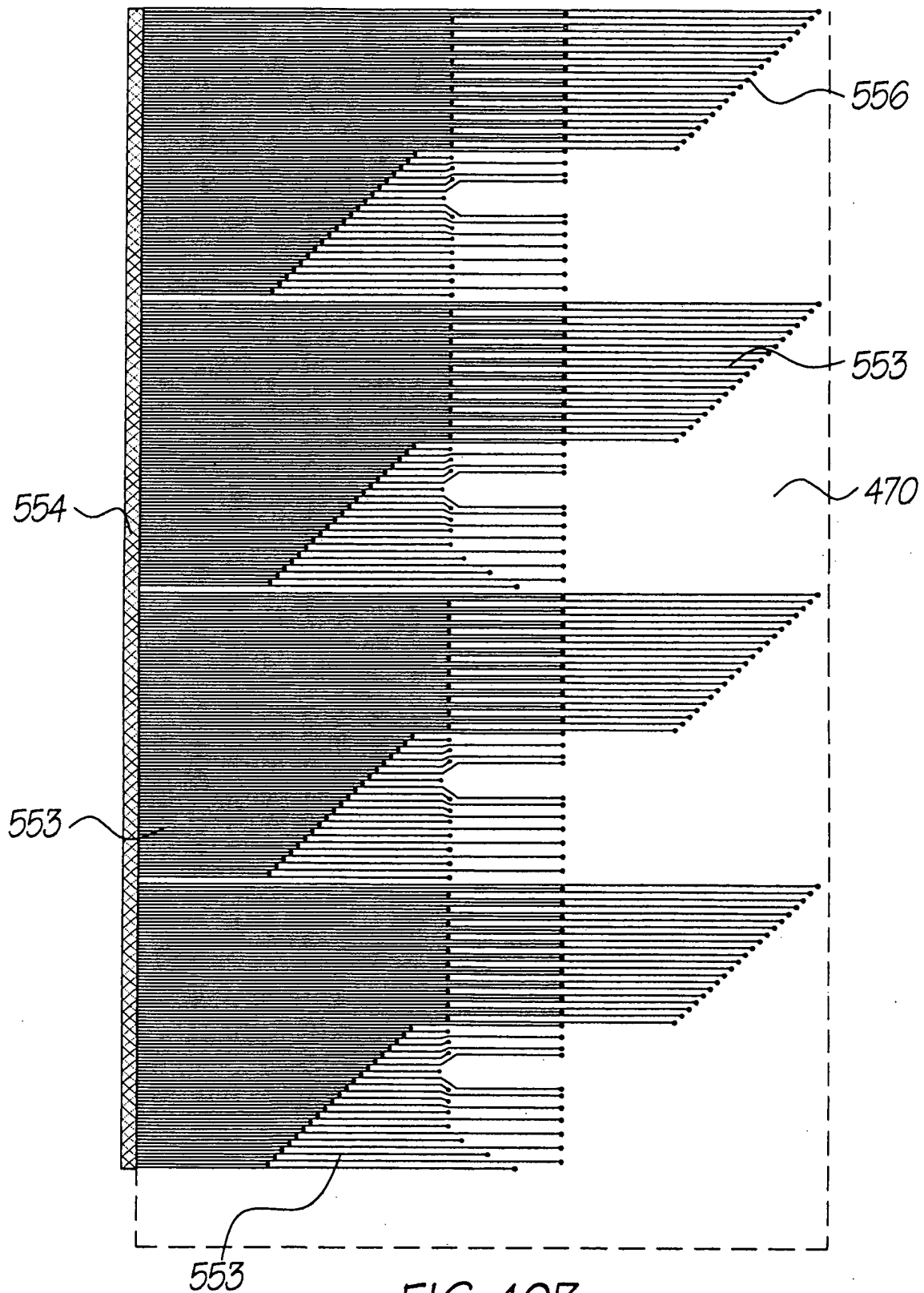


FIG. 103